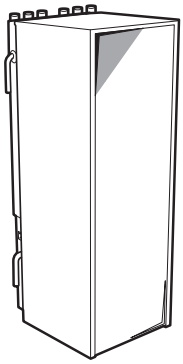
Installer reference guide

Daikin Altherma ground source heat pump



EGSQH10S18AA9W

Installer reference guide
Daikin Altherma ground source heat pump

English

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1 General safety precautions

1.1 About the documentation

- The original documentation is written in English. All other languages are translations.
- The precautions described in this document cover very important topics, follow them carefully.
- All activities described in the installation manual must be performed by an authorized installer.

1.1.1 Meaning of warnings and symbols

DANGER
Indicates a situation that results in death or serious injury.

DANGER: RISK OF ELECTROCUTION
Indicates a situation that could result in electrocution.

DANGER: RISK OF BURNING
Indicates a situation that could result in burning because of extreme hot or cold temperatures.

WARNING
Indicates a situation that could result in death or serious injury.

CAUTION
Indicates a situation that could result in minor or moderate injury.

NOTICE
Indicates a situation that could result in equipment or property damage.

INFORMATION
Indicates useful tips or additional information.

1.2 For the installer

1.2.1 General

If you are not sure how to install or operate the unit, contact your dealer.

NOTICE
Improper installation or attachment of equipment or accessories could result in electric shock, short-circuit, leaks, fire or other damage to the equipment. Only use accessories, optional equipment and spare parts made or approved by Daikin.

WARNING
Make sure installation, testing and applied materials comply with applicable legislation (on top of the instructions described in the Daikin documentation).

CAUTION
Wear adequate personal protective equipment (protective gloves, safety glasses,…) when installing, maintaining or servicing the system.

WARNING

Tear apart and throw away plastic packaging bags so that nobody, especially children, can play with them. Possible risk: suffocation.

DANGER: RISK OF BURNING

- Do NOT touch the refrigerant piping, water piping or internal parts during and immediately after operation. It could be too hot or too cold. Give it time to return to normal temperature. If you must touch it, wear protective gloves.
- Do NOT touch any accidental leaking refrigerant.

NOTICE

Provide adequate measures to prevent that the unit can be used as a shelter by small animals. Small animals that make contact with electrical parts can cause malfunctions, smoke or fire.

NOTICE

- Do NOT place any objects or equipment on top of the unit.
- Do NOT sit, climb or stand on the unit.

In accordance with the applicable legislation, it might be necessary to provide a logbook with the product containing at least: information on maintenance, repair work, results of tests, stand-by periods,…

Also, at least, following information must be provided at an accessible place at the product:

- Instructions for shutting down the system in case of an emergency
- Name and address of fire department, police and hospital
- Name, address and day and night telephone numbers for obtaining service

In Europe, EN378 provides the necessary guidance for this logbook.

1.2.2 Installation site

- Provide sufficient space around the unit for servicing and air circulation.
- Make sure the installation site withstands the unit's weight and vibration.
- Make sure the area is well ventilated.
- Make sure the unit is level.
- Make sure that the floor, where the unit will be installed, is level.

Do NOT install the unit in the following places:

- In potentially explosive atmospheres.
- In places where there is machinery that emits electromagnetic waves. Electromagnetic waves may disturb the control system, and cause malfunction of the equipment.
- In places where there is a risk of fire due to the leakage of flammable gases (example: thinner or gasoline), carbon fibre, ignitable dust.
- In places where corrosive gas (example: sulphurous acid gas) is produced. Corrosion of copper pipes or soldered parts may cause the refrigerant to leak.

1.2.3 Refrigerant

NOTICE

Make sure refrigerant piping installation complies with applicable legislation. In Europe, EN378 is the applicable standard.

NOTICE

Make sure the field piping and connections are not subjected to stress.

WARNING

During tests, NEVER pressurize the product with a pressure higher than the maximum allowable pressure (as indicated on the nameplate of the unit).

WARNING

Take sufficient precautions in case of refrigerant leakage. If refrigerant gas leaks, ventilate the area immediately. Possible risks:

- Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency.
- Toxic gas may be produced if refrigerant gas comes into contact with fire.

WARNING

Always recover the refrigerants. Do NOT release them directly into the environment. Use a vacuum pump to evacuate the installation.

NOTICE

After all the piping has been connected, make sure there is no gas leak. Use nitrogen to perform a gas leak detection.

NOTICE

- Refrigerant cannot be charged until field wiring has been completed.
- Refrigerant may only be charged after performing the leak test and the vacuum drying.
- When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.
- When the refrigerant system is to be opened, refrigerant must be treated according to the applicable legislation.

- To avoid compressor breakdown, do not charge the refrigerant more than the specified amount.
- In case re-charge is required, refer to the nameplate of the unit. It states the type of refrigerant and necessary amount.
- The unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant.
- Only use tools exclusively for the refrigerant type used in the system, this to ensure pressure resistance and prevent foreign materials from entering into the system.
- Charge the liquid refrigerant as follows:

If	Then
A siphon tube is present (i.e., the cylinder is marked with "Liquid filling siphon attached")	Charge with the cylinder upright.
A siphon tube is NOT present	Charge with the cylinder upside down.

- Open refrigerant cylinders slowly.
- Charge the refrigerant in liquid form. Adding it in gas form may prevent normal operation.

CAUTION

When the refrigerant charging procedure is done or when pausing, close the valve of the refrigerant tank immediately. If the tank is left with the valve open, the amount of refrigerant which is properly charged may get off point. More refrigerant may be charged by any remaining pressure after the unit has stopped.

1.2.4 Brine

If applicable. See the installation manual or installer reference guide of your application for more information.

WARNING

The selection of the brine MUST be in accordance with the applicable legislation.

WARNING

Take sufficient precautions in case of brine leakage. If brine leaks, ventilate the area immediately and contact your local dealer.

WARNING

The ambient temperature inside the unit can get much higher than that of the room, e.g. 70°C. In case of a brine leak, hot parts inside the unit can create a hazardous situation.

WARNING

The use and installation of the application MUST comply with the safety and environmental precautions specified in the applicable legislation.

1.2.5 Water

NOTICE

Make sure water quality complies with EU directive 98/83 EC.

1.2.6 Electrical

DANGER: RISK OF ELECTROCUTION

- Turn OFF all power supply before removing the switch box cover, connecting electrical wiring or touching electrical parts.
- Disconnect the power supply for more than 1 minute, and measure the voltage at the terminals of main circuit capacitors or electrical components before servicing. The voltage MUST be less than 50 V DC before you can touch electrical components. For the location of the terminals, see the wiring diagram.
- Do NOT touch electrical components with wet hands.
- Do NOT leave the unit unattended when the service cover is removed.

WARNING

If NOT factory installed, a main switch or other means for disconnection, having a contact separation in all poles providing full disconnection under overvoltage category III condition, shall be installed in the fixed wiring.

WARNING

- ONLY use copper wires.
- All field wiring must be performed in accordance with the wiring diagram supplied with the product.
- NEVER squeeze bundled cables and make sure they do not come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections.
- Make sure to install earth wiring. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock.
- Make sure to use a dedicated power circuit. NEVER use a power supply shared by another appliance.
- Make sure to install the required fuses or circuit breakers.
- Make sure to install an earth leakage protector. Failure to do so may cause electric shock or fire.
- When installing the earth leakage protector, make sure it is compatible with the inverter (resistant to high frequency electric noise) to avoid unnecessary opening of the earth leakage protector.

Install power cables at least 1 meter away from televisions or radios to prevent interference. Depending on the radio waves, a distance of 1 meter may not be sufficient.

WARNING

- After finishing the electrical work, confirm that each electrical component and terminal inside the electrical components box is connected securely.
- Make sure all covers are closed before starting up the unit.

NOTICE

Only applicable if the power supply is three-phase, and the compressor has an ON/OFF starting method.

If there exists the possibility of reversed phase after a momentary black out and the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase can break the compressor and other parts.

2 About the documentation

2.1 About this document

Target audience

Authorised installers

Documentation set

This document is part of a documentation set. The complete set consists of:

Document	Contains…	Format
General safety precautions	Safety instructions that you must read before installing	Paper (in the box of the indoor unit)
Indoor unit installation manual	Installation instructions	

Document	Contains…	Format
Installer reference guide	Preparation of the installation, technical specifications, good practices, reference data, …	Digital files on http://www.daikineurope.com/support-and-manuals/product-information/.
Addendum book for optional equipment	Additional info about how to install optional equipment	Paper (in the box of the indoor unit) Digital files on http://www.daikineurope.com/support-and-manuals/product-information/.

Latest revisions of the supplied documentation may be available on the regional Daikin website or via your dealer.

2.2 Installer reference guide at a glance

Chapter	Description
General safety precautions	Safety instructions that you must read before installing
About the documentation	What documentation exists for the installer
About the box	How to unpack the units and remove their accessories
About the units and options	▪ How to identify the units ▪ Possible combinations of units and options
Application guidelines	Various installation setups of the system
Preparation	What to do and know before going on-site
Installation	What to do and know to install the system
Configuration	What to do and know to configure the system after it is installed
Commissioning	What to do and know to commission the system after it is configured
Hand-over to the user	What to give and explain to the user
Maintenance and service	How to maintain and service the units
Troubleshooting	What to do in case of problems
Disposal	How to dispose of the system
Technical data	Specifications of the system
Glossary	Definition of terms

3 About the box

3.1 Overview: About the box

This chapter describes what you have to do after the box with the indoor unit is delivered on-site.

It contains information about:

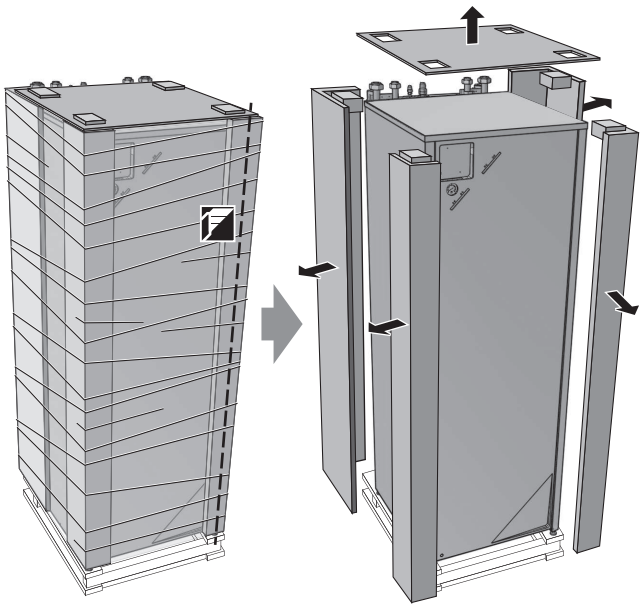
- Unpacking and handling the units
- Removing the accessories from the units

Keep the following in mind:

- At delivery, the unit must be checked for damage. Any damage must be reported immediately to the carrier's claims agent.
- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.

3.2 Indoor unit

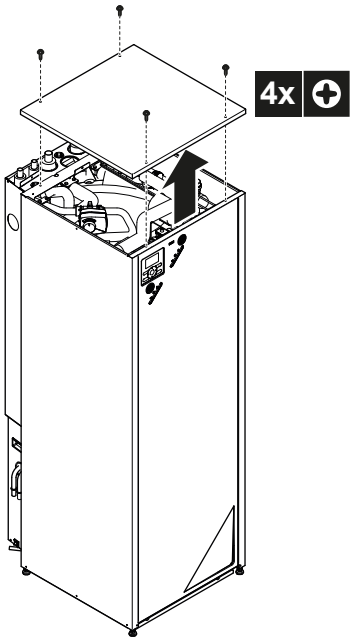
3.2.1 To unpack the indoor unit



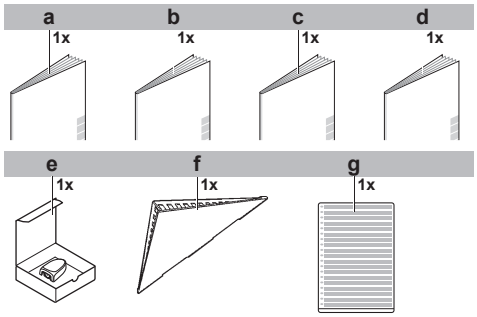
3.2.2 To remove the accessories from the indoor unit

1 Remove the screws at the top of the unit.

2 Remove the top panel.



3 Remove the accessories.



a General safety precautions
b Addendum book for optional equipment
c Installation manual
d Operation manual
e Remote outdoor sensor
f User interface kit cover
g Multilingual fluorinated greenhouse gases label

4 Reinstall the top panel.

4 About the units and options

4.1 Overview: About the units and options

This chapter contains information about:

- Identifying the indoor unit
- Combining the indoor unit with options

4.2 Identification

NOTICE

When installing or servicing several units at the same time, make sure NOT to switch the service panels between different models.

4.2.1 Identification label: Indoor unit

Location

Model identification

Example: E GS Q H 10 S 18 AA 9W

Code	Description
E	European model
GS	Ground source heat pump
Q	Refrigerant R410A
H	Heating only
10	Capacity class: 10 kW
S	Integrated tank material: Stainless steel
18	Integrated tank volume: 180 l
AA	Series
9W	Backup heater model: 9W

4.3 Possible options for the indoor unit

User interface (EKRUCBL*)

The user interface and a possible additional user interface are available as an option.

The additional user interface can be connected:

- To have both:
  - control close to the indoor unit,
  - room thermostat functionality in the principal space to be heated.
- To have an interface containing other languages.

Following user interfaces are available:

- EKRUCBL1 contains following languages: German, French, Dutch, Italian.
- EKRUCBL2 contains following languages: English, Swedish, Norwegian, Finnish.
- EKRUCBL3 contains following languages: English, Spanish, Greek, Portuguese.
- EKRUCBL4 contains following languages: English, Turkish, Polish, Romanian.
- EKRUCBL5 contains following languages: German, Czech, Slovenian, Slovakian.
- EKRUCBL6 contains following languages: English, Croatian, Hungarian, Estonian.
- EKRUCBL7 contains following languages: English, German, Russian, Danish.

Languages on the user interface can be uploaded by PC software or copied from an user interface to the other.

For installation instructions, see "7.6.6 To connect the user interface" on page 33.

Room thermostat (EKRTWA, EKRTR1)

You can connect an optional room thermostat to the indoor unit. This thermostat can either be wired (EKRTWA) or wireless (EKRTR1).

For installation instructions, see the installation manual of the room thermostat and addendum book for optional equipment.

Remote sensor for wireless thermostat (EKRTETS)

You can use a wireless indoor temperature sensor (EKRTETS) only in combination with the wireless thermostat (EKRTR1).

For installation intructions, see the installation manual of the room thermostat and addendum book for optional equipment.

Digital I/O PCB (EKRP1HB)

The digital I/O PCB is required to provide following signals:

- Alarm output
- Space heating On/OFF output
- Changeover to external heat source

For installation instructions, see the installation manual of the digital I/O PCB and addendum book for optional equipment.

Demand PCB (EKRP1AHTA)

To enable the power saving consumption control by digital inputs you must install the demand PCB.

For installation instructions, see the installation manual of the demand PCB and addendum book for optional equipment.

Remote indoor sensor (KRCS01-1)

By default the internal user interface sensor will be used as room temperature sensor.

As an option the remote indoor sensor can be installed to measure the room temperature on another location.

For installation instructions, see the installation manual of the remote indoor sensor and addendum book for optional equipment.

INFORMATION

The remote indoor sensor can only be used in case the user interface is configured with room thermostat functionality.

PC configurator (EKPCCAB)

The PC cable makes a connection between the switch box of the indoor unit and a PC. It gives the possibility to upload different language files to the user interface and indoor parameters to the indoor unit. For the available language files, contact your local dealer.

The software and corresponding operating instructions are available on http://www.daikineurope.com/support-and-manuals/software-downloads/.

For installation instructions, see the installation manual of the PC cable and "8 Configuration" on page 36.

Cable for brine pressure switch connection (EKGSCONBP1)

Depending on the applicable legislation, you might have to install a brine pressure switch (field supply). To connect the brine pressure switch to the unit, you can use the cable for brine pressure switch connection.

For installation instructions, see the installation manual of the cable for brine pressure switch connection.

NOTICE

Daikin recommends to use a mechanical brine pressure switch. If an electrical brine pressure switch is used, capacitive currents might disturb the flow switch operation causing an error on the unit.

5 Application guidelines

5.1 Overview: Application guidelines

The purpose of the application guidelines is to give a glance of the possibilities of the Daikin heat pump system.

NOTICE

- The illustrations in the application guidelines are meant for reference only, and are NOT to be used as detailed hydraulic diagrams. The detailed hydraulic dimensioning and balancing are NOT shown, and are the responsibility of the installer.
- For more information about the configuration settings to optimize heat pump operation, see "8 Configuration" on page 36.

INFORMATION

Energy metering functionality is NOT applicable and/or NOT valid for this unit if it is calculated by the unit. If optional external meters are used, energy metering display is valid.

This chapter contains applications guidelines for:

- Setting up the space heating system
- Setting up an auxiliary heat source for space heating
- Setting up the domestic hot water tank
- Setting up the energy metering
- Setting up the power consumption
- Setting up an external temperature sensor

5.2 Setting up the space heating system

The Daikin heat pump system supplies leaving water to heat emitters in one or more rooms.

Because the system offers a wide flexibility to control the temperature in each room, you need to answer the following questions first:

- How many rooms are heated by the Daikin heat pump system?
- Which heat emitter types are used in each room and what is their design leaving water temperature?

Once the space heating requirements are clear, Daikin recommends to follow the setup guidelines below.

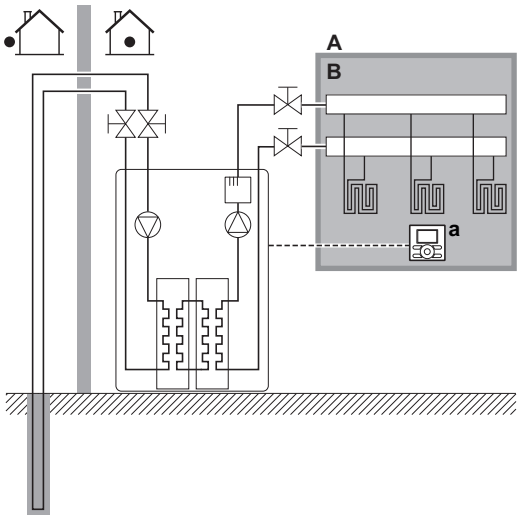
NOTICE

If an external room thermostat is used, the external room thermostat will control the room frost protection. However, the room frost protection is only possible if the leaving water temperature control on the unit's user interface is turned ON.

5.2.1 Single room

Under floor heating or radiators – Wired room thermostat

Setup



A Main leaving water temperature zone
B One single room
a User interface used as room thermostat

- The under floor heating or radiators are directly connected to the indoor unit.
- The room temperature is controlled by the user interface, which is used as room thermostat. Possible installations:
  - User interface (standard equipment) installed in the room and used as room thermostat
  - User interface (standard equipment) installed at the indoor unit and used for control close to the indoor unit + user interface (optional equipment EKRUCBL*) installed in the room and used as room thermostat

Configuration

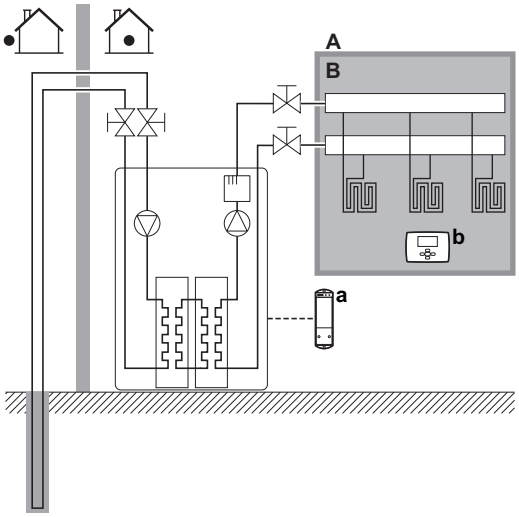
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

Benefits

- **Cost effective**. You do NOT need an additional external room thermostat.
- **Highest comfort and efficiency**. The smart room thermostat functionality can decrease or increase the desired leaving water temperature based on the actual room temperature (modulation). This results in:
  - Stable room temperature matching the desired temperature (higher comfort)
  - Less ON/OFF cycles (more quiet, higher comfort and higher efficiency)
  - Lowest possible leaving water temperature (higher efficiency)
- **Easy**. You can easily set the desired room temperature via the user interface:
  - For your daily needs, you can use preset values and schedules.
  - To deviate from your daily needs, you can temporarily overrule the preset values and schedules, use the holiday mode…

Under floor heating or radiators – Wireless room thermostat

Setup



A Main leaving water temperature zone
B One single room
a Receiver for wireless external room thermostat
b Wireless external room thermostat

- The under floor heating or radiators are directly connected to the indoor unit.
- The room temperature is controlled by the wireless external room thermostat (optional equipment EKRTR1).

Configuration

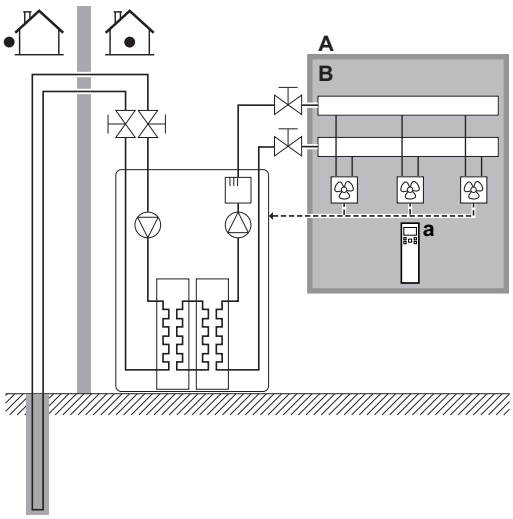
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main
External room thermostat for the **main** zone: ▪ #: [A.2.2.4] ▪ Code: [C-05]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

Benefits

- **Wireless**. The Daikin external room thermostat is available in a wireless version.
- **Efficiency**. Although the external room thermostat only sends ON/OFF signals, it is specifically designed for the heat pump system.

Heat pump convectors

Setup



A Main leaving water temperature zone
B One single room
a Remote controller of the heat pump convectors

- The heat pump convectors are directly connected to the indoor unit.
- The desired room temperature is set via the remote controller of the heat pump convectors.
- The space heating demand signal is sent to one digital input on the indoor unit (X2M/1 and X2M/4).
- The space operation mode is sent to the heat pump convectors by one digital output on the indoor unit (X2M/33 and X2M/34).

INFORMATION

When using multiple heat pump convectors, make sure each one receives the infrared signal from the remote controller of the heat pump convectors.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main
External room thermostat for the **main** zone: ▪ #: [A.2.2.4] ▪ Code: [C-05]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

Benefits

- **Efficiency**. Optimal energy efficiency because of the interlink function.
- **Stylish**.

5.2.2 Multiple rooms – One LWT zone

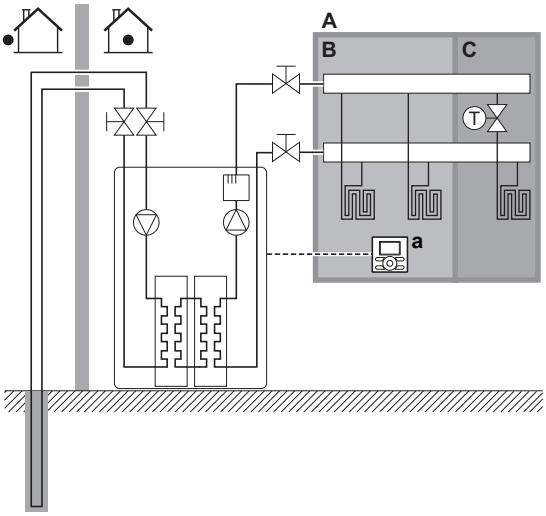
If only one leaving water temperature zone is needed because the design leaving water temperature of all heat emitters is the same, you do NOT need a mixing valve station (cost effective).

Example: If the heat pump system is used to heat up one floor where all the rooms have the same heat emitters.

Under floor heating or radiators – Thermostatic valves

If you are heating up rooms with under floor heating or radiators, a very common way is to control the temperature of the main room by using a thermostat (this can either be the user interface or an external room thermostat), while the other rooms are controlled by so-called thermostatic valves, which open or close depending on the room temperature.

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a User interface

- The under floor heating of the main room is directly connected to the indoor unit.
- The room temperature of the main room is controlled by the user interface used as thermostat.
- A thermostatic valve is installed before the under floor heating in each of the other rooms.

INFORMATION

Mind situations where the main room can be heated by another heating source. Example: Fireplaces.

Configuration

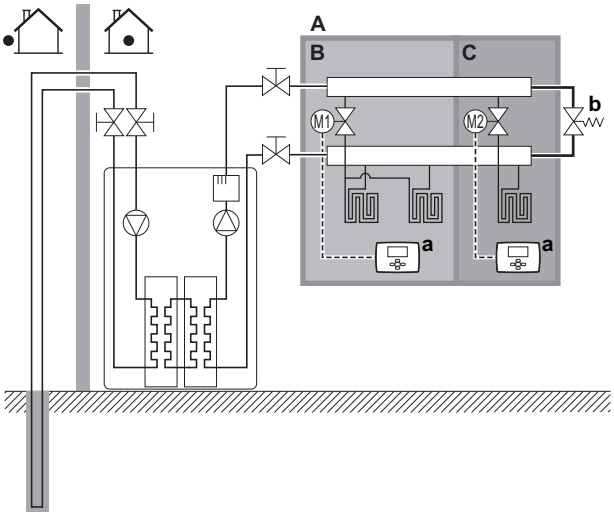
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

Benefits

- **Cost effective**.
- **Easy**. Same installation as for one room, but with thermostatic valves.

Under floor heating or radiators – Multiple external room thermostats

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a External room thermostat
b Bypass valve

- For each room, a shut-off valve (field supplied) is installed to avoid leaving water supply when there is no heating demand.
- A bypass valve must be installed to make water recirculation possible when all shut-off valves are closed.
- The user interface connected to the indoor unit decides the space operation mode. Mind that the operation mode on each room thermostat must be set to match the indoor unit.
- The room thermostats are connected to the shut-off valves, but do NOT have to be connected to the indoor unit. The indoor unit will supply leaving water all the time, with the possibility to program a leaving water schedule.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

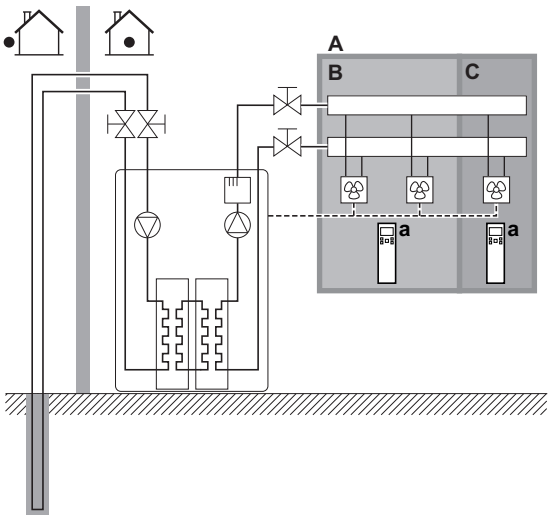
Benefits

Compared with under floor heating or radiators for one room:

- **Comfort**. You can set the desired room temperature, including schedules, for each room via the room thermostats.

Heat pump convectors

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a Remote controller of the heat pump convectors

- The desired room temperature is set via the remote controller of the heat pump convectors.
- The user interface connected to the indoor unit decides the space operation mode.
- The heating demand signals of each heat pump convector are connected in parallel to the digital input on the indoor unit (X2M/1 and X2M/4). The indoor unit will only supply leaving water temperature when there is an actual demand.

INFORMATION

To increase comfort and performance, Daikin recommends to install the valve kit option EKVKHPC on each heat pump convector.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

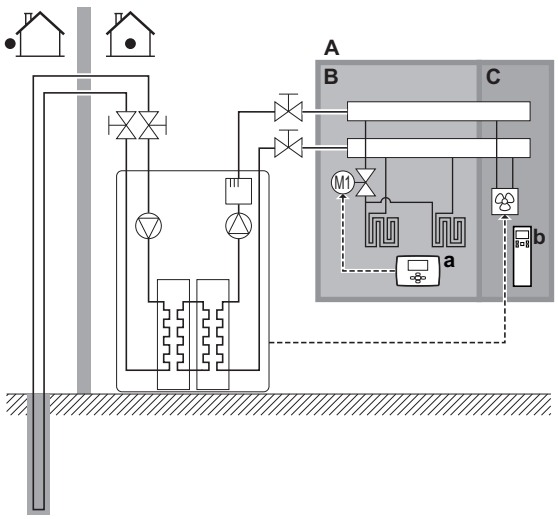
Benefits

Compared with heat pump convectors for one room:

- **Comfort**. You can set the desired room temperature, including schedules, for each room via the remote controller of the heat pump convectors.

Combination: Under floor heating + Heat pump convectors

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a External room thermostat
b Remote controller of the heat pump convectors

- For each room with heat pump convectors: The heat pump convectors are directly connected to the indoor unit.
- For each room with under floor heating: A shut-off valve (field supply) is installed before the under floor heating. It prevents hot water supply when the room has no heating demand.
- For each room with heat pump convectors: The desired room temperature is set via the remote controller of the heat pump convectors.
- For each room with under floor heating: The desired room temperature is set via the external room thermostat (wired or wireless).
- The user interface connected to the indoor unit decides the space operation mode. Mind that the operation mode on each external room thermostat and remote controller of the heat pump convectors must be set to match the indoor unit.

INFORMATION

To increase comfort and performance, Daikin recommends to install the valve kit option EKVKHPC on each heat pump convector.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	0 (LWT control): Unit operation is decided based on the leaving water temperature.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

5.2.3 Multiple rooms – Two LWT zones

If the heat emitters selected for each room are designed for different leaving water temperatures, you can use different leaving water temperature zones (maximum 2).

In this document:

- Main zone = Zone with the lowest design temperature
- Additional zone = The other zone

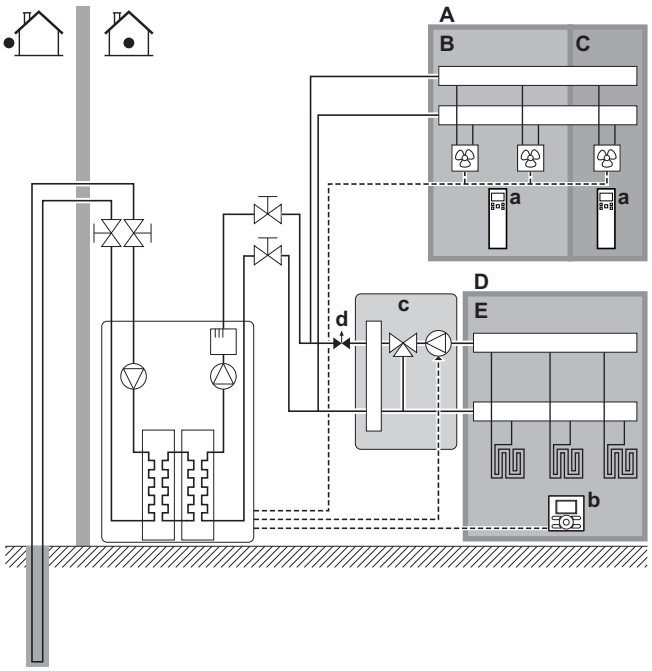
CAUTION

When there is more than one leaving water zone, you must ALWAYS install a mixing valve station in the main zone to decrease (in heating) the leaving water temperature when the additional zone has demand.

Typical example:

Room (zone)	Heat emitters: Design temperature
Living room (main zone)	Under floor heating: 35°C
Bed rooms (additional zone)	Heat pump convectors: 45°C

Setup



A Additional leaving water temperature zone
B Room 1
C Room 2
D Main leaving water temperature zone
E Room 3
a Remote controller of the heat pump convectors
b User interface
c Mixing valve station
d Pressure regulating valve

INFORMATION

A pressure regulating valve should be implemented before the mixing valve station. This is to guarantee the correct water flow balance between the main leaving water temperature zone and the additional leaving water temperature zone in relation to the required capacity of both water temperature zones.

- For the main zone:
  - A mixing valve station is installed before the under floor heating.
  - The pump of the mixing valve station is controlled by the ON/OFF signal on the indoor unit (X2M/5 and X2M/7; normal closed shut-off valve output).
  - The room temperature is controlled by the user interface, which is used as room thermostat.
- For the additional zone:
  - The heat pump convectors are directly connected to the indoor unit.
  - The desired room temperature is set via the remote controller of the heat pump convectors for each room.
  - The heating demand signals of each heat pump convector are connected in parallel to the digital input on the indoor unit (X2M/1 and X2M/4). The indoor unit will only supply the desired additional leaving water temperature when there is an actual demand.
- The user interface connected to the indoor unit decides the space operation mode. Mind that the operation mode on each remote controller of the heat pump convectors must be set to match the indoor unit.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface. **Note:** ▪ Main room = user interface used as room thermostat functionality ▪ Other rooms = external room thermostat functionality
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	1 (2 LWT zones): Main + additional
In case of heat pump convectors: External room thermostat for the **additional** zone: ▪ #: [A.2.2.5] ▪ Code: [C-06]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.
Shut-off valve output	Set to follow the thermo demand of the main zone.
At the mixing valve station	Set the desired main leaving water temperature.

Benefits

- **Comfort.**
  - The smart room thermostat functionality can decrease or increase the desired leaving water temperature based on the actual room temperature (modulation).
  - The combination of the two heat emitter systems provides the excellent heating comfort of the under floor heating, and the rapid air heat up of the heat pump convectors (e.g., living room=under floor heating and the bedroom=convector (no continuous heating)).
- **Efficiency.**
  - Depending on the demand, the indoor unit supplies different leaving water temperature matching the design temperature of the different heat emitters.
  - Under floor heating has the best performance with Altherma LT.

5.3 Setting up an auxiliary heat source for space heating

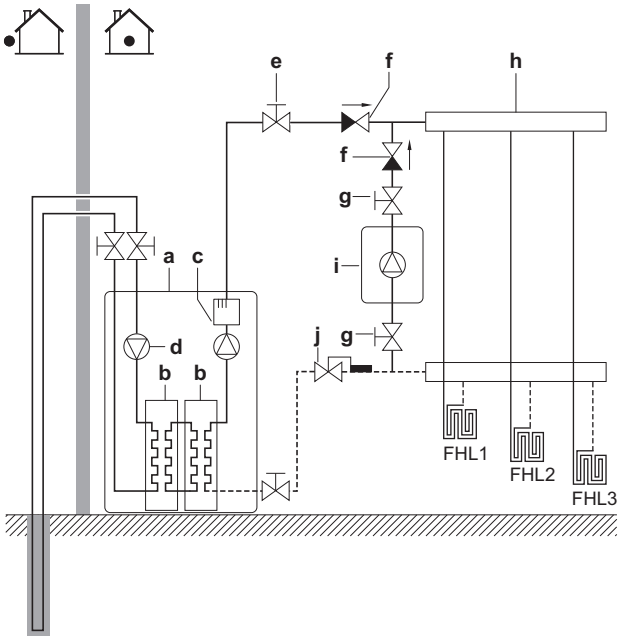
- Space heating can be done by:
  - The indoor unit
  - An auxiliary boiler (field supply) connected to the system
- When the room thermostat requests heating, the indoor unit or the auxiliary boiler starts operating depending on the outdoor temperature (status of the changeover to external heat source). When the permission is given to the auxiliary boiler, the space heating by the indoor unit is turned OFF.
- Bivalent operation is only possible for space heating, NOT for domestic hot water production. Domestic hot water is always produced by the DHW tank connected to the indoor unit.

INFORMATION

- During heating operation of the heat pump, the heat pump operates to achieve the desired temperature set via the user interface. When weather-dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature.
- During heating operation of the auxiliary boiler, the auxiliary boiler operates to achieve the desired water temperature set via the auxiliary boiler controller.

Setup

- Integrate the auxiliary boiler as follows:



a Indoor unit
b Heat exchanger
c Backup heater
d Pump
e Shut-off valve
f Non-return valve (field supply)
g Shut-off valve (field supply)
h Collector (field supply)
i Auxiliary boiler (field supply)
j Aquastat valve (field supply)
FHL1...3 Under floor heating

NOTICE

- Make sure the auxiliary boiler and its integration in the system complies with applicable legislation.
- Daikin is NOT responsible for incorrect or unsafe situations in the auxiliary boiler system.

- Make sure the return water to the heat pump does NOT exceed 55°C. To do so:
  - Set the desired water temperature via the auxiliary boiler controller to maximum 55°C.
  - Install an aquastat valve in the return water flow of the heat pump.
  - Set the aquastat valve to close above 55°C and to open below 55°C.
- Install non-return valves.
- Make sure to only have one expansion vessel in the water circuit. An expansion vessel is already premounted in the indoor unit.
- Install the digital I/O PCB (option EKRP1HB).
- Connect X1 and X2 (changeover to external heat source) on the PCB to the auxiliary boiler thermostat.
- To setup the heat emitters, see "5.2 Setting up the space heating system" on page 8.

Configuration

Via the user interface (quick wizard):

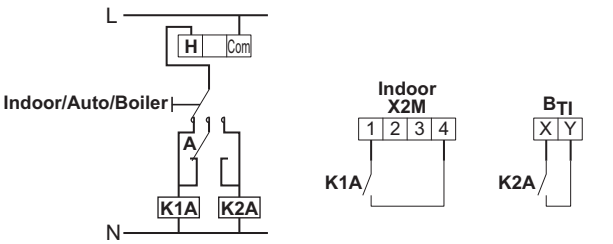
- Set the use of a bivalent system as external heat source.
- Set the bivalent temperature and hysteresis.

NOTICE

- Make sure the bivalent hysteresis has enough differential to prevent frequent changeover between indoor unit and auxiliary boiler.
- Frequent changeover may cause corrosion of the auxiliary boiler. Contact the manufacturer of the auxiliary boiler for more information.

Changeover to external heat source decided by an auxiliary contact

- Only possible in external room thermostat control AND one leaving water temperature zone (see "5.2 Setting up the space heating system" on page 8).
- The auxiliary contact can be:
  - An outdoor temperature thermostat
  - An electricity tariff contact
  - A manually operated contact
  - …
- Setup: Connect the following field wiring:



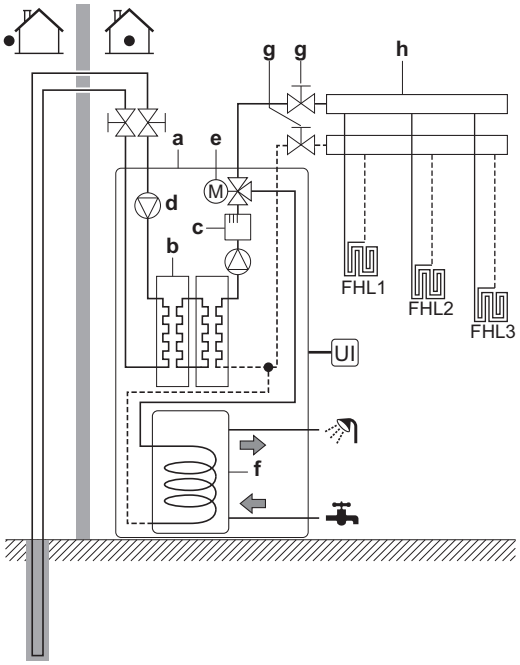
B_{TI}	Boiler thermostat input
A	Auxiliary contact (normal closed)
H	Heating demand room thermostat (optional)
K1A	Auxiliary relay for activation of indoor unit (field supply)
K2A	Auxiliary relay for activation of boiler (field supply)
Indoor	Indoor unit
Auto	Automatic
Boiler	Boiler

NOTICE

- Make sure the auxiliary contact has enough differential or time delay to prevent frequent changeover between indoor unit and auxiliary boiler.
- If the auxiliary contact is an outdoor temperature thermostat, install the thermostat in the shadow so that it is NOT influenced or turned ON/OFF by direct sunlight.
- Frequent changeover may cause corrosion of the auxiliary boiler. Contact the manufacturer of the auxiliary boiler for more information.

5.4 Setting up the domestic hot water tank

5.4.1 System layout – Integrated DHW tank



a	Indoor unit
b	Heat exchanger
c	Backup heater
d	Pump
e	Motorised 3-way valve
f	DHW tank
g	Shut-off valve
h	Collector (field supply)
FHL1...3	Under floor heating
UI	User interface

5.4.2 Selecting the desired temperature for the DHW tank

People experience water as hot when its temperature is 40°C. Therefore, the DHW consumption is always expressed as equivalent hot water volume at 40°C. However, you can set the DHW tank temperature at a higher temperature (example: 53°C), which is then mixed with cold water (example: 15°C).

Selecting the volume and desired temperature for the DHW tank consists of:

1 Determining the DHW consumption (equivalent hot water volume at 40°C).
2 Determining the volume and desired temperature for the DHW tank.

Possible DHW tank volumes

Type	Possible volumes
Integrated DHW tank	▪ 180 l

Energy saving tips

- If the DHW consumption differs from day to day, you can program a weekly schedule with different desired DHW tank temperatures for each day.
- The lower the desired DHW tank temperature, the more cost effective.
- The heat pump itself can produce domestic hot water of maximum 55°C. The electrical resistance integrated in the heat pump can higher this temperature. However, this consumes more energy. Daikin recommends to set the desired DHW tank temperature below 55°C to avoid using the electrical resistance.
- When the heat pump produces domestic hot water, it cannot heat up a space. When you need domestic hot water and space heating at the same, Daikin recommends to produce the domestic hot water during the night when there is lower space heating demand.

Determining the DHW consumption

Answer the following questions and calculate the DHW consumption (equivalent hot water volume at 40°C) using the typical water volumes:

Question	Typical water volume
How many showers are needed per day?	1 shower=10 min×10 l/min=100 l
How many baths are needed per day?	1 bath=150 l
How much water is needed at the kitchen sink per day?	1 sink=2 min×5 l/min=10 l
Are there any other domestic hot water needs?	—

Example: If the DHW consumption of a family (4 persons) per day is as follows:

- 3 showers
- 1 bath
- 3 sink volumes

Then the DHW consumption = (3×100 l)+(1×150 l)+(3×10 l)=480 l

Determining the volume and desired temperature for the DHW tank

Formula	Example
$V_1=V_2+V_2\times(T_2-40)/(40-T_1)$	If: ▪ V_2=180 l ▪ T_2=54°C ▪ T_1=15°C Then V_1=280 l
$V_2=V_1\times(40-T_1)/(T_2-T_1)$	If: ▪ V_1=480 l ▪ T_2=54°C ▪ T_1=15°C Then V_2=307 l

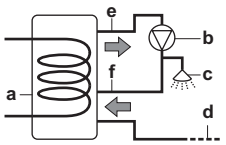
V_1 DHW consumption (equivalent hot water volume at 40°C)
V_2 Required DHW tank volume if only heated once
T_2 DHW tank temperature
T_1 Cold water temperature

5.4.3 Setup and configuration – DHW tank

- For large DHW consumptions, you can heat up the DHW tank several times during the day.
- To heat up the DHW tank to the desired DHW tank temperature, you can use the following energy sources:
  - Thermodynamic cycle of the heat pump
  - Electrical backup heater
- For more information about optimizing the energy consumption for producing domestic hot water, see "8 Configuration" on page 36.

5.4.4 DHW pump for instant hot water

Setup



a DHW tank
b DHW pump
c Shower
d Cold water
e Domestic hot water OUT
f Recirculation connection

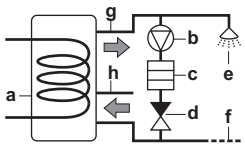
- By connecting a DHW pump, instant hot water can be available at the tap.
- The DHW pump and the installation are field supply and the responsibility of the installer.
- For more information about connecting the recirculation connection: see "7 Installation" on page 24.

Configuration

- For more information, see "8 Configuration" on page 36.
- You can program a schedule to control the DHW pump via the user interface. For more information, see the user reference guide.

5.4.5 DHW pump for disinfection

Setup



a DHW tank
b DHW pump
c Heater element
d Non-return valve
e Shower
f Cold water
g Domestic hot water OUT
h Recirculation connection

- The DHW pump and the installation are field supply and the responsibility of the installer.
- The temperature of the DHW tank can be set to maximum 60°C. If applicable legislation requires higher temperature for disinfection, you can connect a DHW pump and heater element as shown above.
- If applicable legislation requires disinfection of the water piping until the tapping point, you can connect a DHW pump and heater element (if needed) as shown above.

Configuration

The indoor unit can control DHW pump operation. For more information, see "8 Configuration" on page 36.

5.5 Setting up the energy metering

- Via the user interface, you can read out the following energy data:
  - Produced heat
  - Consumed energy
- You can read out the energy data:
  - For space heating
  - For domestic hot water production
- You can read out the energy data:
  - Per month
  - Per year

INFORMATION

The calculated produced heat and consumed energy are an estimation, the accuracy cannot be guaranteed.

5.5.1 Produced heat

INFORMATION

The sensors used to calculate the produced heat are calibrated during the "Pump test (space heating)" actuator test run. The calibration is reset when the software is updated.

- The produced heat is calculated internally based on:
  - The leaving and entering water temperature
  - The flow rate
- Setup and configuration: No additional equipment needed.

5.5.2 Consumed energy

Measuring the consumed energy

- Requires external power meters.
- Setup and configuration:
  - For the specifications of each type of meter, see "14 Technical data" on page 66.
  - When using electrical power meters, set the number of pulses/kWh for each power meter via the user interface. Consumed energy data will only be available if this setting is configured.

INFORMATION

When measuring the electrical power consumption, make sure ALL power input of the system is covered by the electrical power meters.

5.5.3 Normal kWh rate power supply

General rule

One power meter that covers the entire system is sufficient.

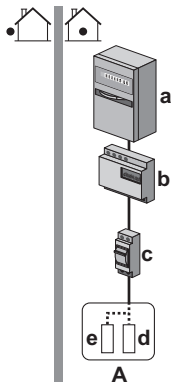
Setup

Connect the power meter to X5M/7 and X5M/8.

Power meter type

Use a three-phase power meter.

Example



A Indoor unit
a Electrical cabinet ($L_1/L_2/L_3/N$)
b Power meter ($L_1/L_2/L_3/N$)
c Fuse ($L_1/L_2/L_3/N$)
d Backup heater ($L_1/L_2/L_3/N$)
e Indoor unit ($L_1/L_2/L_3/N$)

Exception

- You can use a second power meter if:
  - The power range of one meter is insufficient.
  - The electrical meter cannot easily be installed in the electrical cabinet.
- Connection and setup:
  - Connect the second power meter to X5M/9 and X5M/10.
  - In the software the power consumption data of both meters is added so you do NOT have to set which meter covers which power consumption. You only need to set the number of pulses of each power meter.
- See "5.5.4 Preferential kWh rate power supply" on page 17 for an example with two power meters.

5.5.4 Preferential kWh rate power supply

Setup

- Connect power meter 1 to X5M/7 and X5M/8.
- Connect power meter 2 to X5M/9 and X5M/10.

Refer to "6.4.3 Overview of electrical connections except external actuators" on page 23.

5.6 Setting up the power consumption control

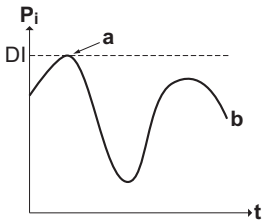
- The power consumption control:
  - Allows you to limit the power consumption of the entire system (sum of indoor unit and backup heater).
  - Configuration: Set the power limitation level and how it has to be achieved via the user interface.
- The power limitation level can be expressed as:
  - Maximum running current (in A)
  - Maximum power input (in kW)
- The power limitation level can be activated:
  - Permanently
  - By digital inputs

INFORMATION

- During emergency operation, the power consumption control will NOT be used. This is because the backup heater has a higher capacity then during normal operation (9 kW instead of 6 kW) and therefore the power calculated by the unit will be lower then the actual power.
- If power limitation is enabled, water temperature set points above 60°C in space heating are NOT guaranteed.

5.6.1 Permanent power limitation

Permanent power limitation is useful to assure a maximum power or current input of the system. In some countries, legislation limits the maximum power consumption for space heating and DHW production.



P_i Power input
t Time
DI Digital input (power limitation level)
a Power limitation active
b Actual power input

Setup and configuration

- No additional equipment needed.
- Set the power consumption control settings as described in "To modify an overview setting" on page 37 via the user interface (for the description of all settings, see "8 Configuration" on page 36):
  - Select full time limitation mode
  - Select the type of limitation (power in kW or current in A)
  - Set the desired power limitation level

NOTICE

Set a minimum power consumption of ±3 kW to guarantee space heating and DHW production by allowing at least backup heater step 1.

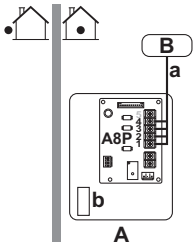
5.6.2 Power limitation activated by digital inputs

Power limitation is also useful in combination with an energy management system.

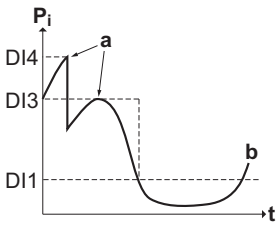
The power or current of the entire Daikin system is limited dynamically by digital inputs. Power limitation level is set via the user interface by limiting one of the following:

- Current (in A)
- Power input (in kW)

The energy management system (field supply) decides the activation of a certain power limitation level. **Example:** To limit the maximum power of the entire house (lighting, domestic appliances, space heating…).



A Indoor unit
B Energy management system
a Power limitation activation (4 digital inputs)
b Backup heater



P_i Power input
t Time
DI Digital inputs (power limitation levels)
a Power limitation active
b Actual power input

Setup

- Demand PCB (option EKRP1AHTA) needed.
- Maximum four digital inputs are used to activate the corresponding power limitation level:
  - DI1 = weakest limitation (highest energy consumption)
  - DI4 = strongest limitation (lowest energy consumption)
- For the specification and the connection of the digital inputs, see "14.5 Wiring diagram – components: Indoor unit" on page 71.

Configuration

Set the power consumption control settings as described in "To modify an overview setting" on page 37 via the user interface (for the description of all settings, see "8 Configuration" on page 36):

- Select activation by digital inputs.
- Select the type of limitation (power in kW or current in A).
- Set the desired power limitation level corresponding to each digital input.

INFORMATION

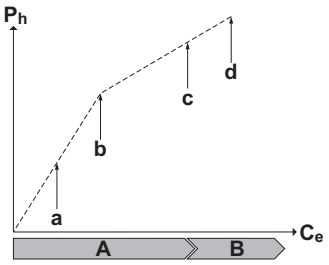
In case more than 1 digital input is closed (at the same time), the digital input priority is fixed: DI4 priority>…>DI1.

5.6.3 Power limitation process

The compressor has better efficiency than the electrical heater. Therefore, the electrical heater is limited and turned OFF first. The system limits power consumption in the following order:

1 Limits electrical heater.
2 Turn OFF the electrical heater.
3 Limits the compressor.
4 Turns OFF the compressor.

Example



P_h	Produced heat
C_e	Consumed energy
A	Compressor
B	Backup heater
a	Limited compressor operation
b	Full compressor operation
c	Backup heater step 1 turned ON
d	Backup heater step 2 turned ON

5.7 Setting up an external temperature sensor

Indoor ambient temperature

You can connect one external temperature sensor. It can measure the indoor ambient temperature. Daikin recommends to use an external temperature sensor in the following cases:

- In room thermostat control, the user interface is used as room thermostat and it measures the indoor ambient temperature. Therefore, the user interface must be installed on a location:
  - Where the average temperature in the room can be detected
  - That is NOT exposed to direct sunlight
  - That is NOT near a heat source
  - That is NOT affected by outside air or air draught because of, for example, door opening/closing
- If this is NOT possible, Daikin recommends to connect a remote indoor sensor (option KRCS01-1).
- Setup: For installation instructions, see the installation manual of the remote indoor sensor.
- Configuration: Select room sensor [A.2.2.B].

Outdoor ambient temperature

The remote outdoor sensor (delivered as accessory) measures the outdoor ambient temperature.

- Setup:
  - To install the remote outdoor sensor outside, see the installation manual of the sensor (delivered as accessory).
  - To connect the remote outdoor sensor to the indoor unit, see "7.6.5 To connect the remote outdoor sensor" on page 32.
- Configuration: None.

6 Preparation

6.1 Overview: Preparation

This chapter describes what you have to do and know before going on-site.

It contains information about:

- Preparing the installation site
- Preparing the piping
- Preparing the electrical wiring

6.2 Preparing installation site

Do NOT install the unit in places often used as work place. In case of construction works (e.g. grinding works) where a lot of dust is created, the unit must be covered.

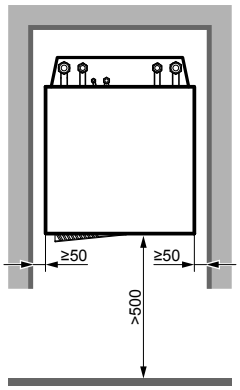
Choose the installation location with sufficient place for carrying the unit in and out of the site.

6.2.1 Installation site requirements of the indoor unit

INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

- Mind the following spacing installation guidelines:



(mm)

Do NOT install the unit in places such as:

- Where there is mist of mineral oil, oil spray or vapour.
  Plastic parts may deteriorate, and cause them to fall out or water to leak.
- Sound sensitive areas (e.g. near a bedroom and the like), so that the operation noise will cause no trouble.
- The foundation must be strong enough to bear the weight of the unit. Take the weight of the unit with a domestic hot water tank full of water into account.
  Make sure, in the event of a water leak, water cannot cause any damage to the installation space and surroundings.
- In places with high humidity (max. RH=85%), for example a bathroom.
- In places where frost is possible. Ambient temperature around the indoor unit should be >5°C.
- The indoor unit is designed for indoor installation only and for ambient temperatures ranging 5~30°C in heating mode.

6.3 Preparing piping

6.3.1 Circuit requirements

INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

Circuit types. Except for the refrigerant circuit, inside the unit 2 other circuits are included. For future references: the circuit connected to the bore hole is referred to as the brine circuit, the other circuit connected to the heating emitters is referred to as the space heating circuit.

- **Connecting piping – Legislation.** Make all piping connections in accordance with the applicable legislation and the instructions in the "Installation" chapter, respecting the water inlet and outlet.
- **Connecting piping – Force.** Do NOT use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit.
- **Connecting piping – Tools.** Only use appropriate tooling to handle brass, which is a soft material. If NOT, pipes will get damaged.
- **Connecting piping – Air, moisture, dust.** If air, moisture or dust gets into the circuit, problems may occur. To prevent this:
  - Only use clean pipes
  - Hold the pipe end downwards when removing burrs.
  - Cover the pipe end when inserting it through a wall, to prevent dust and/or particles entering the pipe.
  - Use a decent thread sealant to seal connections.
- **Closed circuit.** Use the indoor unit ONLY in a closed water system for brine circuit and space heating circuit. Using the system in an open water system will lead to excessive corrosion.

WARNING

When connecting to an open groundwater system, an intermediate heat exchanger is required to prevent damage (dirt, freeze ups) to the unit.

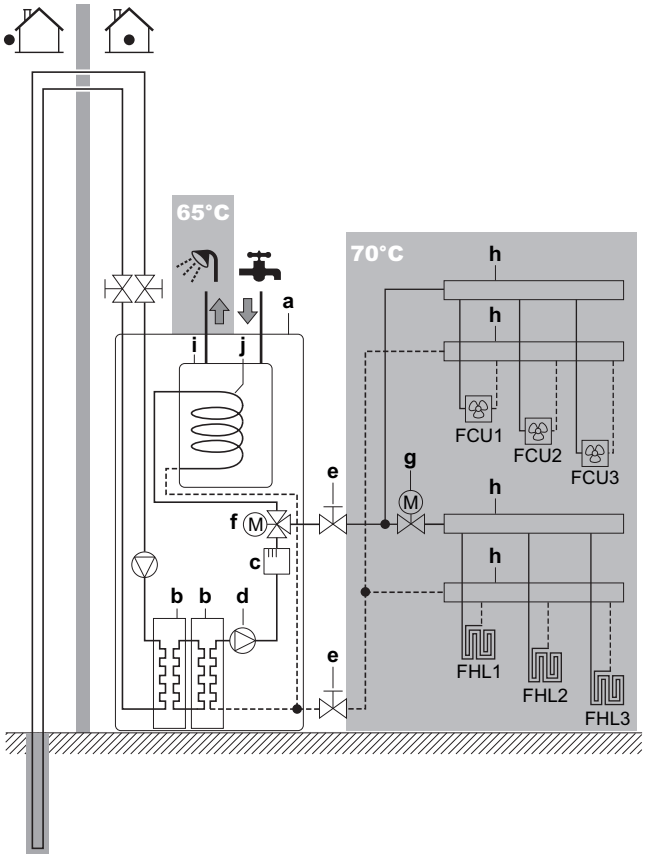
- **Glycol.** For safety reasons, it is NOT allowed to add any kind of glycol to the space heating circuit.
- **Piping length.** It is recommended to avoid long runs of piping between the domestic hot water tank and the hot water end point (shower, bath,…) and to avoid dead ends.
- **Piping diameter.** Select the piping diameter in relation to the required flow and the available external static pressure of the pump. See "14 Technical data" on page 66 for the external static pressure curves of the indoor unit.
- **Fluid flow.** You can find the minimum required water for the indoor unit operation in the following table. When the flow is lower, flow error 7H will be displayed and the indoor unit will be stopped.

Model	Minimum flow
10	▪ Space heating circuit: 8 l/min ▪ Brine circuit: 25 l/min

- **Field supply components – Fluid.** Only use materials that are compatible with fluid used in the system and with the materials used in the indoor unit.
- **Field supply components – Fluid pressure and temperature.** Check that all components in the field piping can withstand the fluid pressure and fluid temperature.
- **Fluid pressure – Space heating and brine circuit.** The maximum fluid pressure of the space heating and brine circuit is 4 bar. Provide adequate safeguards in the water circuit to ensure that the maximum pressure is NOT exceeded.
- **Fluid pressure – Domestic hot water tank.** The maximum fluid pressure of the domestic hot water tank is 10 bar. Provide adequate safeguards in the water circuit to ensure that the maximum pressure is NOT exceeded.
- **Fluid temperature.** All installed piping and piping accessories (valve, connections,…) MUST withstand the following temperatures:

INFORMATION

The following illustration is an example and may NOT match your system layout.



a	Indoor unit
b	Heat exchanger
c	Backup heater
d	Pump
e	Stop valve
f	Motorised 3-way valve
g	Motorised 2-way valve (field supply)
h	Collector
i	Domestic hot water tank
j	Heat exchanger coil
FCU1...3	Fan coil unit (optional)
FHL1...3	Floor heating loop

- **Drainage – Low points.** Provide drain taps at all low points of the system in order to allow complete drainage of the circuit.
- **Drainage – Pressure relief valve.** Provide a proper drain for the pressure relief valve to avoid fluid dripping out of the unit. See "7.5.3 To connect the pressure relief valve to the drain" on page 29.

WARNING

- All pipe work connected to the brine pressure relief valve MUST have a continuous fall.
- The discharge pipe from the brine pressure relief valve MUST terminate in a safe, visible position without forming any risk to persons in the vicinity.

- **Air vents.** Provide air vents at all high points of the system, which must also be easily accessible for servicing. At the space heating side, an automatic air purge is provided in the indoor unit. Check that the air purge is NOT tightened too much, so that automatic release of air in the water circuit is possible.
- **Zn-coated parts.** NEVER use Zn-coated parts in the fluid circuit. Because the unit's internal circuit uses copper piping, excessive corrosion may occur. Zn coated parts used in the brine circuit may lead to the precipitation of certain components in the anti-freeze fluids corrosion inhibitor.

WARNING

Due to presence of glycol, corrosion of the system is possible. Uninhibited glycol will turn acidic under the influence of oxygen. This process is accelerated by the presence of copper and high temperatures. The acidic uninhibited glycol attacks metal surfaces and forms galvanic corrosion cells that cause severe damage to the system. Therefore it is important that:

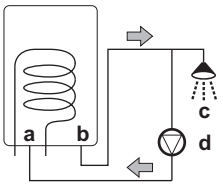
- the water treatment is correctly executed by a qualified water specialist,
- a glycol with corrosion inhibitors is selected to counteract acids formed by the oxidation of glycols,
- no automotive glycol is used because their corrosion inhibitors have a limited lifetime and contain silicates which can foul or plug the system,
- galvanized pipes are NOT used in glycol systems since the presence may lead to the precipitation of certain components in the glycol's corrosion inhibitor.

INFORMATION

Be aware of the hygroscopic property of anti-freeze fluids: it absorbs moisture from its environment. Leaving the cap off the anti-freeze fluid container causes the concentration of water to increase. The anti-freeze fluid concentration is then lower than assumed. And in consequence, freezing can happen after all.

Preventive actions MUST be taken to ensure minimal exposure of the anti-freeze fluid to air.

- **Non-brass metallic piping.** When using non-brass metallic piping, insulate the brass and non-brass properly so that they do NOT make contact with each other. This to prevent galvanic corrosion.
- **Valve – Change-over time.** When using a 2-way valve in the space heating circuit, the maximum change-over time of the valve MUST be 60 seconds.
- **Filter.** It is strongly recommended to install an additional filter on the heating water circuit. Especially to remove metallic particles from foul heating piping, it is advised to use a magnetic or cyclone filter, which can remove small particles. Small particles may damage the unit and will NOT be removed by the standard filter of the heat pump system.
- **Domestic hot water tank – Capacity.** To avoid stagnation of water, it is important that the storage capacity of the domestic hot water tank meets the daily consumption of domestic hot water.
- **Domestic hot water tank – After installation.** Immediately after installation, the domestic hot water tank must be flushed with fresh water. This procedure must be repeated at least once a day the first 5 consecutive days after installation.
- **Domestic hot water tank – Standstills.** In cases where during longer periods of time there is no consumption of hot water, the equipment MUST be flushed with fresh water before usage.
- **Domestic hot water tank – Disinfection.** For the disinfection function of the domestic hot water tank, see "8.3.2 Domestic hot water control: advanced" on page 48.
- **Thermostatic mixing valves.** In accordance with the applicable legislation, it may be necessary to install thermostatic mixing valves.
- **Hygienic measures.** The installation must be in compliance with the applicable legislation and may require additional hygienic installation measures.
- **Recirculation pump.** In accordance with the applicable legislation, it may be required to connect a recirculation pump in between the hot water end point and the recirculation connection of the domestic hot water tank.



a Recirculation connection
b Hot water connection
c Shower
d Recirculation pump

6.3.2 Formula to calculate the expansion vessel pre-pressure

The pre-pressure (Pg) of the vessel depends on the installation height difference (H):

Pg=0.3+(H/10) (bar)

6.3.3 To check the water volume of the space heating circuit and brine circuit

The indoor unit has 2 expansion vessels of 10 litre, one for the space heating circuit and one for the brine circuit.

To make sure that the unit operates properly:

- You must check the minimum and maximum water volume.
- You might need to adjust the pre-pressure of the expansion vessel.
- You must check the total space heating water volume unit.
- You must check the total brine water volume in the unit.

Minimum water volume

Check that the total water volume per circuit in the installation is minimum 20 litre, the internal water volume of the indoor unit NOT included.

INFORMATION

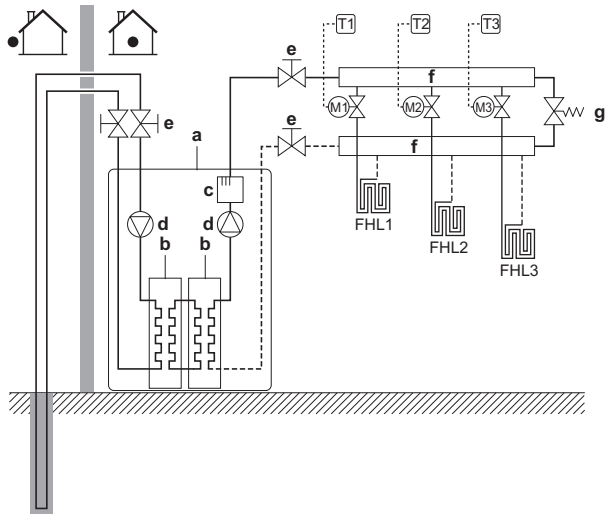
If a minimum heating load of 1 kW can be guaranteed and setting [9-04] is changed by the installer from 1 to 4°C, the minimum water volume can be lowered to 10 litre.

INFORMATION

In critical processes, or in rooms with a high heat load, extra water might be required.

NOTICE

When circulation in each space heating loop is controlled by remotely controlled valves, it is important that the minimum water volume is guaranteed, even if all of the valves are closed.

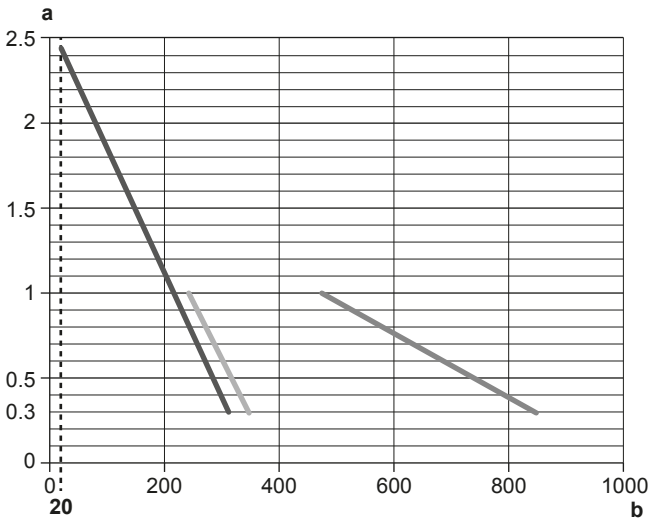


a Indoor unit
b Heat exchanger
c Backup heater
d Pump
e Shut-off valve
f Collector (field supply)
g By-pass valve (field supply)
FHL1...3 Floor heating loop (field supply)
T1...3 Individual room thermostat (optional)
M1...3 Individual motorised valve to control loop FHL1...3 (field supply)

Maximum water volume

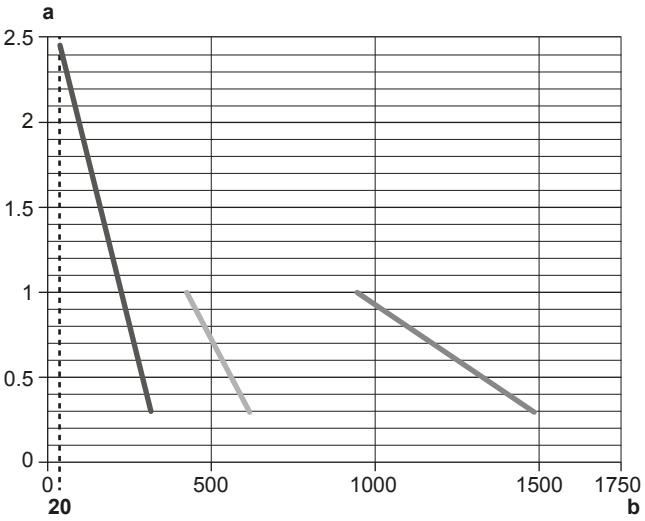
Use the following graphs to determine the maximum water volume for the calculated pre-pressure. For brine, this is dependent on the variation of brine temperature in the system. Example: throughout the year, the temperature of the brine can fluctuate between –7°C and 10°C, as in graph 1, or between 0°C and 10°C as in graph 2.

Graph 1: Brine temperature fluctuation is **17°C**



a Pre-pressure (bar)
b Maximum water volume (l)
Space heating vessel
40% propylene glycol (brine expansion vessel)
30% ethanol (brine expansion vessel)

Graph 2: Brine temperature fluctuation is **10°C**



a Pre-pressure (bar)
b Maximum water volume (l)
Space heating vessel
40% propylene glycol (brine expansion vessel)
30% ethanol (brine expansion vessel)

Example: Maximum water volume and expansion vessel pre-pressure

Installation height difference[(a)]	Water volume	
	≤280 l	>280 l
≤7 m	No pre-pressure adjustment is required.	Do the following: ▪ Decrease the pre-pressure. ▪ Check if the water volume does NOT exceed the maximum allowed water volume.
>7 m	Do the following: ▪ Increase the pre-pressure. ▪ Check if the water volume does NOT exceed the maximum allowed water volume.	The expansion vessel of the indoor unit is too small for the installation. In this case, it is recommended to install an extra vessel outside the unit.

(a) This is the height difference (m) between the highest point of the water circuit and the indoor unit. If the indoor unit is at the highest point of the installation, the installation height is 0 m.

6.3.4 Changing the pre-pressure of the expansion vessel

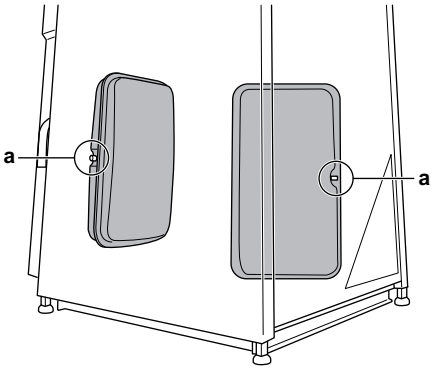
NOTICE

Only a licensed installer may adjust the pre-pressure of the expansion vessel.

When changing the default pre-pressure of the expansion vessel (1 bar) is required, take following guidelines into account:

- Only use dry nitrogen to set the expansion vessel pre-pressure.
- Inappropriate setting of the expansion vessel pre-pressure will lead to malfunction of the system.

Changing the pre-pressure of the expansion vessel should be done by releasing or increasing nitrogen pressure through the schräder valve of the expansion vessel.



a Schräder valve

6.3.5 To check the water volume: Examples

Example 1

The indoor unit is installed 5 m below the highest point in the water circuit. The total water volume in the water circuit is 100 l.

No actions or adjustments are required.

Example 2

The indoor unit is installed at the highest point in the water circuit. The total water volume in the water circuit is 300 l.

Actions:

- Because the total water volume (300 l) is more than the default water volume (280 l), the pre-pressure must be decreased.
- The required pre-pressure is:
  Pg = (0.3+(H/10)) bar = (0.3+(0/10)) bar=0.3 bar.
- The corresponding maximum water volume at 0.3 bar is 350 l. (See the graph in the chapter above).
- Because 300 l is lower than 350 l, the expansion vessel is appropriate for the installation.

6.4 Preparing electrical wiring

6.4.1 About preparing electrical wiring

INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

WARNING

- If the power supply has a missing or wrong N-phase, equipment will break down.
- Establish proper earthing. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earthing may cause electrical shock.
- Install the required fuses or circuit breakers.
- Secure the electrical wiring with cable ties so that the cables do NOT come in contact with the piping or sharp edges, particularly on the high-pressure side
- Do NOT use taped wires, stranded conductor wires, extension cords, or connections from a star system. They can cause overheating, electrical shock or fire.
- Do NOT install a phase advancing capacitor, because this unit is equipped with an inverter. A phase advancing capacitor will reduce performance and may cause accidents.

WARNING

- All wiring must be performed by an authorized electrician and must comply with the applicable legislation.
- Make electrical connections to the fixed wiring.
- All components procured on the site and all electrical construction must comply with the applicable legislation.

WARNING

ALWAYS use multicore cable for power supply cables.

6.4.2 About preferential kWh rate power supply

Electricity companies throughout the world work hard to provide reliable electric service at competitive prices and are often authorized to bill clients at benefit rates. E.g. time-of-use rates, seasonal rates, Wärmepumpentarif in Germany and Austria, ...

This equipment allows for connection to such preferential kWh rate power supply delivery systems.

Consult with the electricity company acting as provider at the site where this equipment is to be installed to know whether it is appropriate to connect the equipment in one of the preferential kWh rate power supply delivery systems available, if any.

When the equipment is connected to such preferential kWh rate power supply, the electricity company is allowed to:

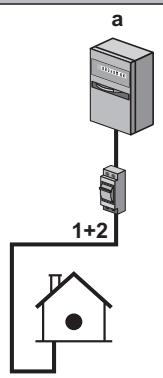
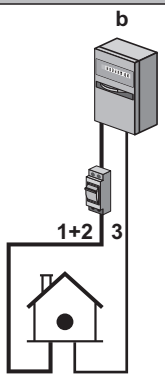
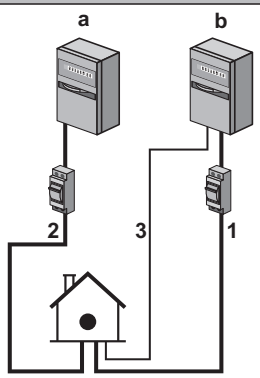
- interrupt power supply to the equipment for certain periods of time;
- demand that the equipment only consumes a limited amount of electricity during certain periods of time.

The indoor unit is designed to receive an input signal by which the unit switches into forced off mode. At that moment, the unit compressor will not operate.

Whether the power supply is interrupted or not, the wiring to the unit is different.

6.4.3 Overview of electrical connections except external actuators

General remark about abbreviations in this and the following chapters:
E1 = Refrigerant cycle components (e.g. compressor) and brine piping parts (e.g. brine pump)
E2 = All other components except backup heater
E3 = Backup heater

Normal power supply	Preferential kWh rate power supply	
	Power supply is NOT interrupted	Power supply is interrupted
	 During preferential kWh rate power supply activation, power supply is NOT interrupted. E1 is turned off by the control. **Remark:** The electricity company MUST always allow the power consumption of E2 and E3.	 During preferential kWh rate power supply activation, power supply is interrupted immediately or after some time by the electricity company. In this case, the hydro PCB MUST be powered by a separate normal power supply.

a Normal power supply
b Preferential kWh rate power supply
1 Power supply for E1 and E3
2 Power supply for E2
3 Preferential kWh rate power supply (voltage free contact)

NOTICE

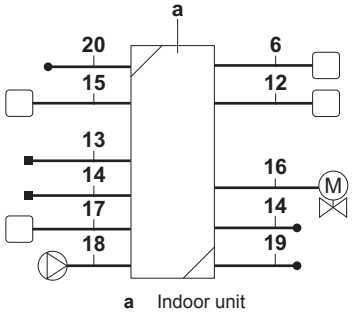
The setting brine freezing temperature can be modified and the read out is correct in [A.6.9] Brine freezeup temp ONLY after having accessed menu [A.8] Overview settings.
This setting can ONLY be modified and/or saved and the read out is ONLY correct if the communication between hydro module and compressor module is present. The communication between hydro module and compressor module is NOT guaranteed and/or applicable if:
- error "U4" appears on the user interface,
- the heat pump module is connected to preferential kWh rate power supply where power supply is interrupted and preferential kWh rate power supply is activated.

6.4.4 Overview of electrical connections for external and internal actuators

The following illustration shows the required field wiring.

INFORMATION

The following illustration is an example and may NOT match your system layout.



a Indoor unit

Item	Description	Wires	Maximum running current
Indoor unit power supply			
1	Power supply for E1 and E3	3+N + GND	(a)
2	Power supply for E2	2	(c)
4	Preferential kWh rate power supply (voltage free contact)	2	(d)
5	Normal kWh rate power supply	2	6.3 A
User interface			
6	User interface	2	(e)
Optional equipment			
12	Room thermostat	3 or 4	100 mA(b)
13	Outdoor ambient temperature sensor	2	(b)
14	Indoor ambient temperature sensor	2	(b)
15	Heat pump convector	4	100 mA(b)
Field supplied components			
16	Shut-off valve	2	100 mA(b)
17	Electricity meter	2 (per meter)	(b)
18	Domestic hot water pump	2	(b)
19	Alarm output	2	(b)
20	Changeover to external heat source control	2	(b)

Item	Description	Wires	Maximum running current
22	Power consumption digital inputs	2 (per input signal)	(b)

(a) Refer to name plate on unit.
(b) Minimum cable section 0.75 mm².
(c) Cable section 2.5 mm².
(d) Cable section 0.75 mm² till 1.25 mm²; maximum length: 50 m. Voltage-free contact shall ensure the minimum applicable load of 15 V DC, 10 mA.
(e) Cable section 0.75 mm² till 1.25 mm²; maximum length: 500 m. Applicable for both single user interface and dual use interface connection.

NOTICE

More technical specifications of the different connections are indicated on the inside of the indoor unit.

7 Installation

7.1 Overview: Installation

This chapter describes what you have to do and know on-site to install the system.

Typical workflow

Installation typically consists of the following stages:

1 Mounting the indoor unit.
2 Connecting the brine piping.
3 Connecting the water piping.
4 Connecting the electrical wiring.
5 Finishing the indoor installation.

7.2 Opening the units

7.2.1 About opening the units

At certain times, you have to open the unit. **Example:**

- When connecting the electrical wiring
- When maintaining or servicing the unit

DANGER: RISK OF ELECTROCUTION

Do NOT leave the unit unattended when the service cover is removed.

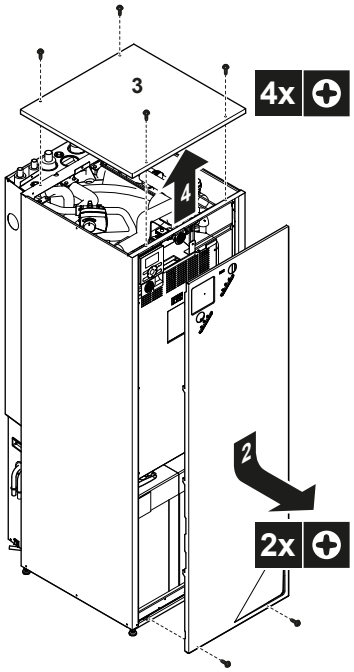
7.2.2 To open the indoor unit

1 Loosen and remove the screws at the bottom of the unit.
2 Slide the front panel of the unit downwards and remove it.

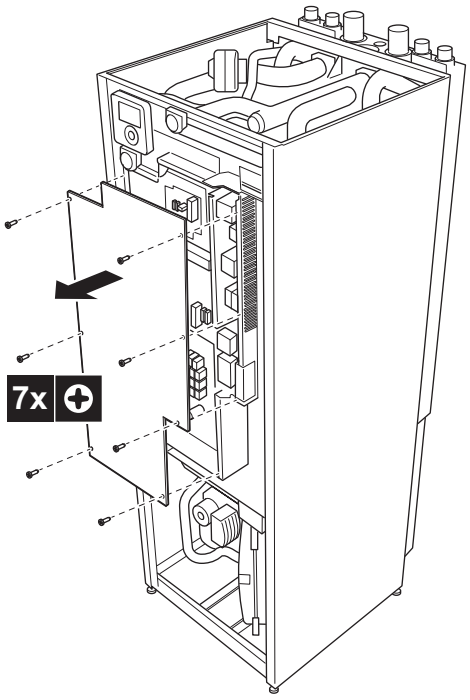
CAUTION

The front panel is heavy. Be careful NOT to jam your fingers when opening or closing the unit.

3 Loosen and remove the 4 screws that fix the top panel.
4 Remove the top panel from the unit.



7.2.3 To open the switch box cover of the indoor unit



7.3 Mounting the indoor unit

7.3.1 About mounting the indoor unit

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

When

You have to mount the indoor unit before you can connect the brine and water piping.

Typical workflow

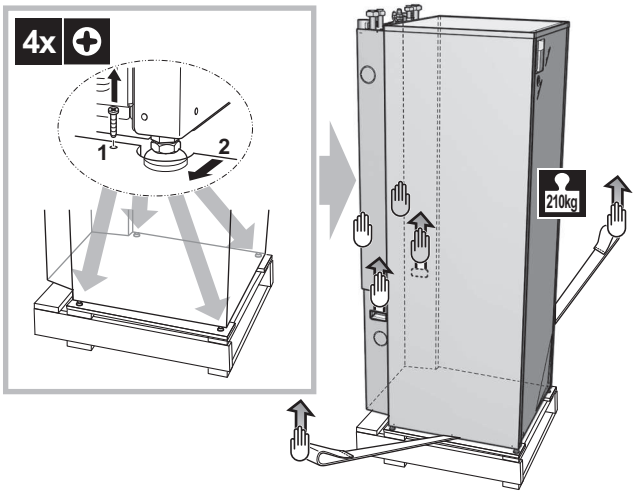
Mounting the indoor unit typically consists of the following stages:

1 Installing the indoor unit.

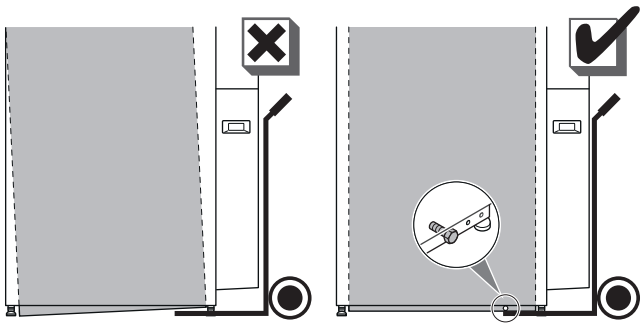
7.3.2 To install the indoor unit

1 Bring the unit on the pallet as close as possible to its installation place.

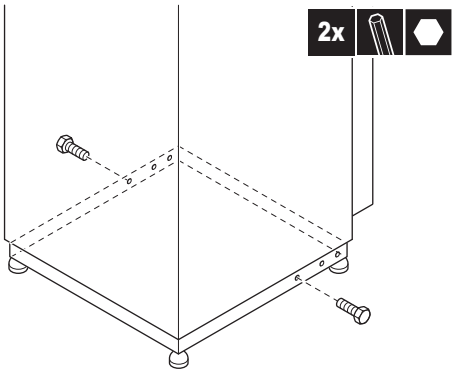
2 Lift the indoor unit from the pallet and place it on the floor.



3 Slide the indoor unit into position. Make sure that the side support bolts are present when handling the unit.

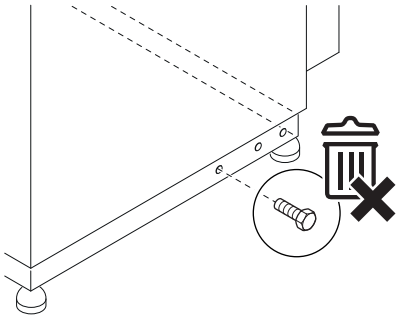


4 Unlink the heat pump module from the outer frame. ONLY remove the side support bolts!

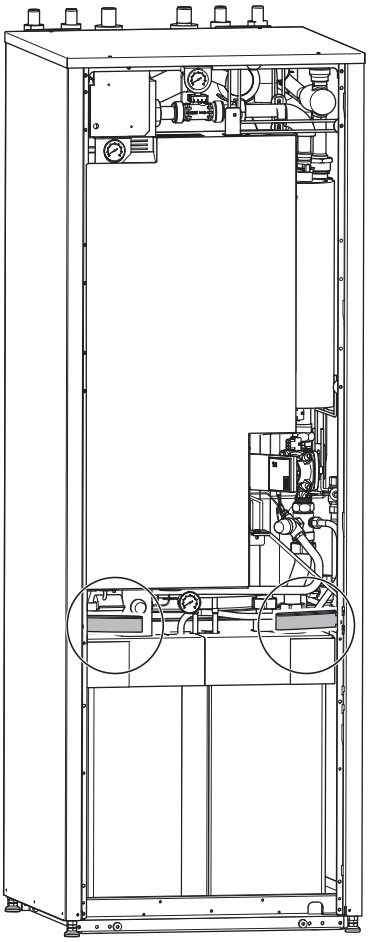


NOTICE

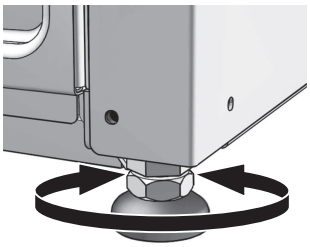
Do NOT throw away any bolts. They need to be re-inserted when transport or heavy manipulation is required.

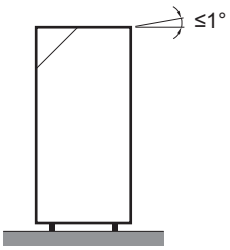


5 Open the front plate of the unit. If needed, the nylon bands for lifting can be used.



6 Adjust the height of the 4 leveling feet of the outer frame to compensate for floor irregularities. The maximum allowed deviation is 1°.





NOTICE

To avoid structural damage on unit, ONLY move the unit when levelling feet are at their lowest position.

NOTICE

For optimum sound reduction, carefully check if there is no gap between the bottom frame and the floor.

7 Adjust the height of the 2 front leveling feet of the inner frame to compensate for irregularities.

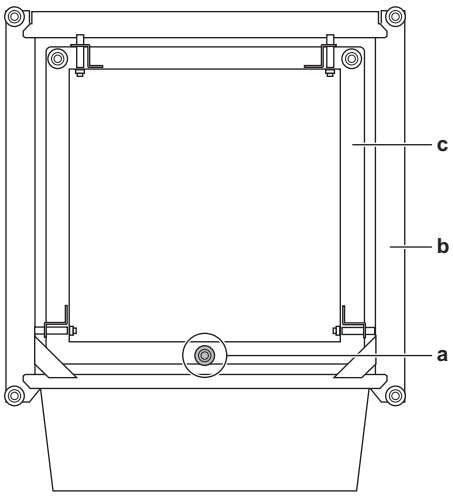
CAUTION

Check that the heat pump module does NOT touch the outer casing.

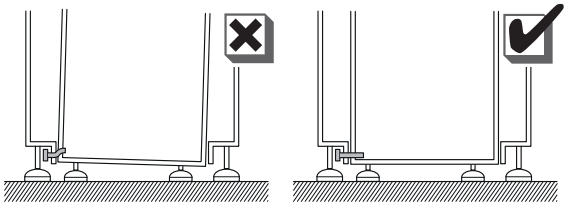
NOTICE

Check if the front support bolts remain levelled and are NOT stressed. The support feet from outer (b) and inner frame (c) MUST be adjusted so that those front bolts remain level. Do NOT adjust support foot (a)!

Bottom view:



Side view:



INFORMATION

To check if the front support bolts are not stressed, loosen them partly and fix them again afterwards.

7.4 Connecting the brine piping

7.4.1 About connecting the brine piping

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

Before connecting the brine piping

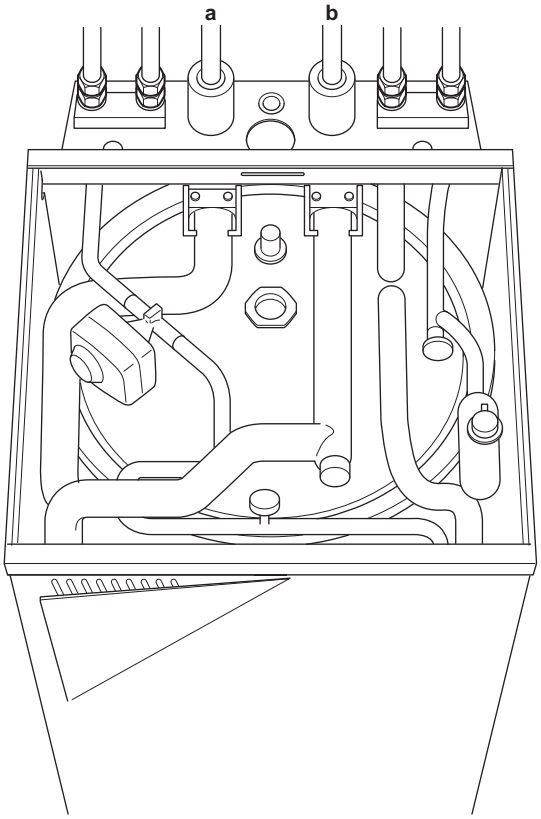
Make sure the indoor unit is mounted.

Typical workflow

Connecting the brine piping typically consists of the following stages:

1 Connecting the brine piping.
2 Filling the brine circuit.
3 Connecting the pressure relief valve to the drain on the brine side.
4 Insulating the brine piping.

7.4.2 To connect the brine piping



a Brine out
b Brine in

NOTICE

To facilitate service and maintenance, it is recommended to install shut-off valves as close as possible to the inlet and outlet of the unit.

7.4.3 To fill the brine circuit

WARNING

Before, during and after filling carefully check the brine circuit for leakage.

WARNING

Temperature of the fluid running through the evaporator can become negative. It MUST be protected against freezing. Refer to setting [A-04] in "8.2.2 Quick wizard: Standard" on page 38.

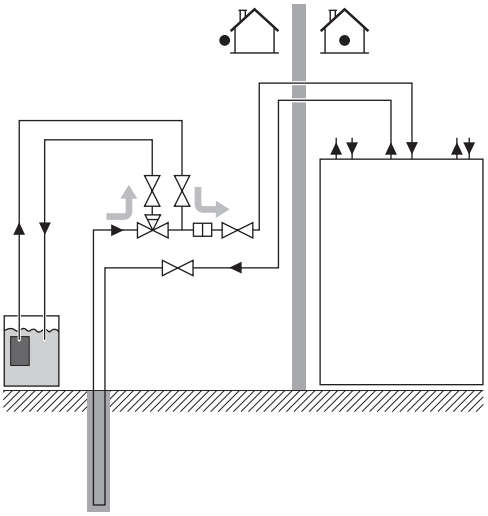
INFORMATION

The materials used in the units brine circuit are chemically resistant to the following anti-freeze fluids:

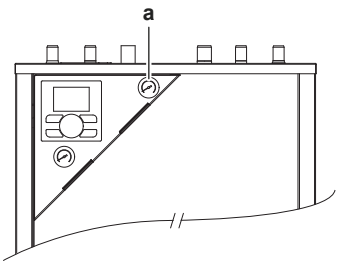
- 40 mass% propylene glycol
- 29 mass% ethanol

1 Connect the unit to the field supplied brine filling system.

2 Position the 3-way valve correctly.



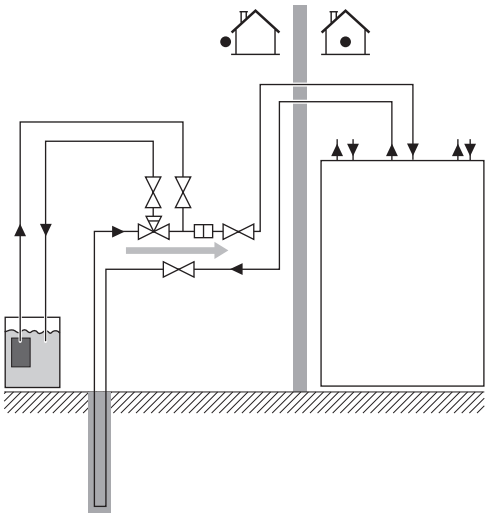
3 Fill the circuit with brine until the manometer indicates a pressure of ±2.0 bar.



a Brine manometer

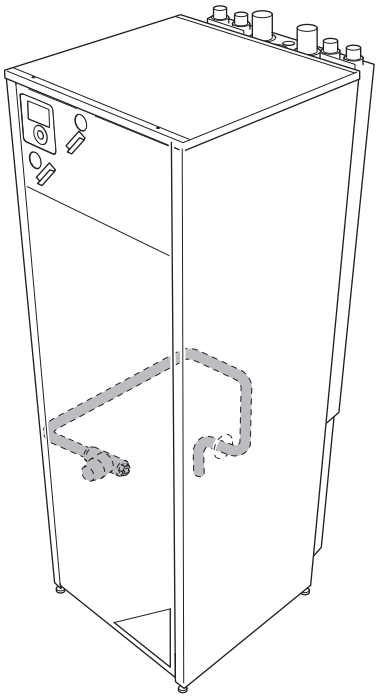
4 Purge as much air as possible from the brine circuit.

5 Return the 3-way valve to its original position.



7.4.4 To connect the pressure relief valve to the drain on the brine side

The blow out of the pressure relief valve is coming out of the backside of the unit.



WARNING

- All pipe work connected to the brine pressure relief valve MUST have a continuous fall.
- The discharge pipe from the brine pressure relief valve MUST terminate in a safe, visible position without forming any risk to persons in the vicinity.

7.4.5 To insulate the brine piping

The piping in the complete brine circuit MUST be insulated to prevent reduction of the heating capacity.

Consider that the brine circuit piping inside the house can/will condensate. Foresee adequate insulation for these pipes.

7.5 Connecting the water piping

7.5.1 About connecting the water piping

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

Before connecting the water piping

Make sure the indoor unit is mounted.

Typical workflow

Connecting the water piping typically consists of the following stages:

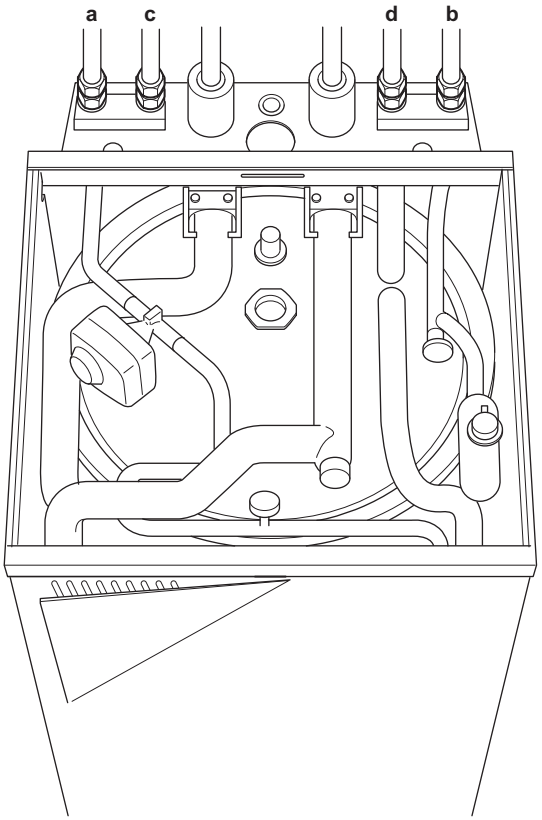
1 Connecting the water piping of the indoor unit.
2 Connecting the pressure relief valve to the drain.
3 Filling the space heating circuit.
4 Filling the domestic hot water tank.
5 Insulating the water piping.
6 Connecting the recirculation piping.
7 Connecting the drain hose.

7.5.2 To connect the water piping

NOTICE

Do NOT use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit.

1 Connect the domestic hot water in and out pipes to the indoor unit.



a Space heating water out
b Space heating water in
c Domestic hot water out
d Domestic cold water in (cold water supply)

NOTICE

It is recommended to install shut-off valves to cold water in and hot water out connections. Shut-off valves are field supplied.

NOTICE

To avoid damage to the surroundings in case of domestic water leakage, it is recommended to close the cold water inlet stop valves during periods of absence.

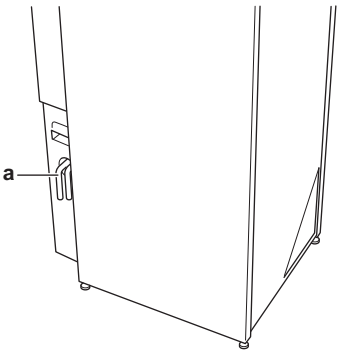
2 Connect the space heating in and out pipes to the indoor unit.

NOTICE

- A drain device and pressure relief device should be installed on the cold water inlet connection of the domestic hot water cylinder.
- To avoid back siphonage, it is recommended to install a non-return valve on the water inlet of the domestic hot water tank in accordance with the applicable legislation.
- It is recommended to install a pressure reducing valve on the cold water inlet in accordance with the applicable legislation.
- An expansion vessel should be installed on the cold water inlet in accordance with the applicable legislation.
- It is recommended to install the pressure relief valve on higher position as top of the domestic hot water tank. Heating of the domestic hot water tank causes water to expand and without pressure relief valve the water pressure inside the tank can rise above the tank design pressure. Also the field installation (piping, tapping points, etc.) connected to the tank is subjected to this high pressure. To prevent this, a pressure relieve valve needs to be installed. The overpressure prevention depends on the correct operation of the field installed pressure relief valve. If this is NOT working correctly, overpressure will deform the tank and water leakage may occur. To confirm good operation, regular maintenance is required.

7.5.3 To connect the pressure relief valve to the drain

The blow out of the pressure relief valve is coming out of the backside of the unit.



a Pressure relief blow-out

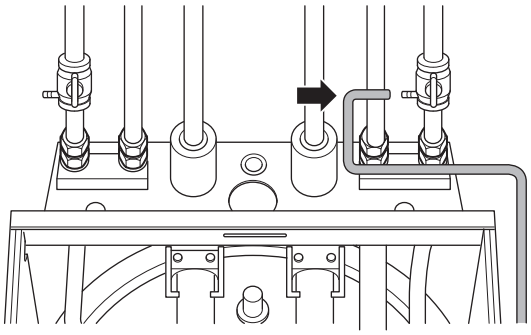
The blow out should be connected to an appropriate drain according to the applicable legislation. It is recommended to use a tundish.

WARNING

The discharge pipes from the pressure relief valves MUST terminate in a safe and visible position without forming any risk to persons in the vicinity.

7.5.4 To fill the space heating circuit

1 Connect the water supply hose to the fill valve (field supply).



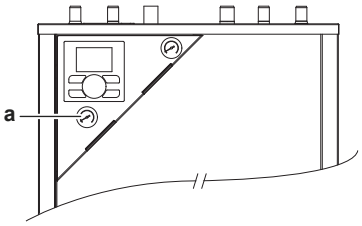
2 Open the fill valve.

3 Make sure that the automatic air purge valve is open (at least 2 turns).

INFORMATION

For location of the air purge valve, see Components: Indoor unit in chapter "14 Technical data" on page 66.

4 Fill the circuit with water until the manometer indicates a pressure of ±2.0 bar.



a Water manometer

5 Purge as much air as possible from the water circuit.

NOTICE

- Air in the water circuit can cause malfunctioning of the backup heater. During filling, it may not be possible to remove all the air from the circuit. Remaining air will be removed through the automatic air purge valves during the initial operating hours of the system. Additional filling with water afterwards may be required.
- To purge the system, use the special function as described in the chapter "9 Commissioning" on page 57. This function should be used to purge the heat exchanger coil of the domestic hot water tank.

6 Close the fill valve.

7 Disconnect the water supply hose from the fill valve.

NOTICE

The water pressure indicated on the manometer will vary depending on the water temperature (higher pressure at higher water temperature).

However, at all times water pressure shall remain above 1 bar to avoid air entering the circuit.

7.5.5 To fill the domestic hot water tank

1 Open every hot water tap in turn to purge air from the system pipe work.

2 Open the cold water supply valve.

3 Close all water taps after all air is purged.

4 Check for water leaks.

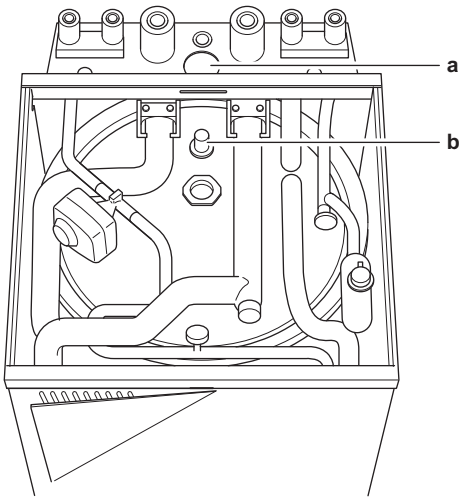
5 Manually operate the field installed pressure relief valve to ensure that free water flow through the discharge pipe.

7.5.6 To insulate the water piping

The piping in the complete water circuit MUST be insulated to prevent reduction of the heating capacity.

7.5.7 To connect the recirculation piping

1 Loosen and remove the screws at the bottom of the unit.
2 Slide the front panel of the unit downwards and remove it.
3 Loosen and remove the 4 screws that fix the top panel.
4 Remove the top panel from the unit.



a Knock-out hole
b Connection for recirculation piping

5 Remove the knock-out hole at the backside of the unit.
6 Connect the recirculation piping to the recirculation connection and route the piping through the knock-out hole at the backside of the unit.
7 Re-attach the insulation and casing.

7.5.8 To connect the drain hose

Condensate can form on the brine components inside the compressor department of the unit. The unit contains a drain pan. Depending on room ambient temperature, room humidity and operation condition, the drain pan can overflow. A drain hose is supplied with the unit.

The drain hose is routed to the backside on the left, close to the bottom of the unit. A field supplied drain pump might be needed to pump the water away to the field drain.

7.6 Connecting the electrical wiring

DANGER: RISK OF ELECTROCUTION

INFORMATION

More information about the legend and the location of the wiring diagram of the unit can be found in "14.5 Wiring diagram" on page 71.

WARNING

ALWAYS use multicore cable for power supply cables.

7.6.1 About connecting the electrical wiring

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

Before connecting the electrical wiring

Make sure the brine and water piping are connected.

Typical workflow

Connecting the electrical wiring typically consists of the following stages:

1 Making sure the power supply system complies with the electrical specifications of the heat pump.
2 Connecting the electrical wiring to the indoor unit.
3 Connecting the main power supply.
4 Connecting the remote outdoor sensor.
5 Connecting the user interface.
6 Connecting the shut–off valves.
7 Connecting the electrical meters.
8 Connecting the domestic hot water pump.
9 Connecting the alarm output.
10 Connecting the space heating ON/OFF output.
11 Connecting the changeover to an external heat source.
12 Connecting the power consumption digital inputs.

7.6.2 About electrical compliance

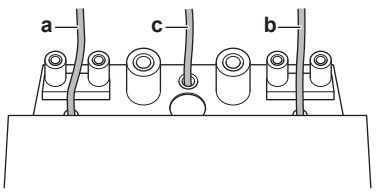
Equipment complying with EN/IEC 61000-3-12 (European/ International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤75 A per phase.).

7.6.3 To connect the electrical wiring on the indoor unit

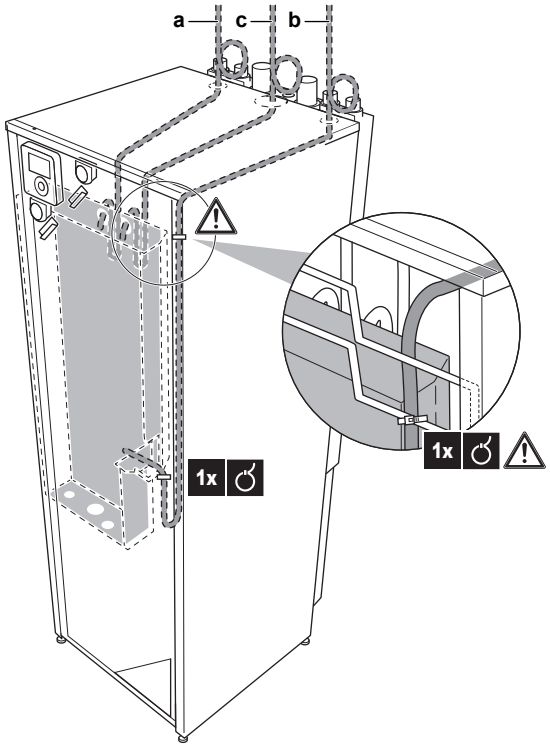
INFORMATION

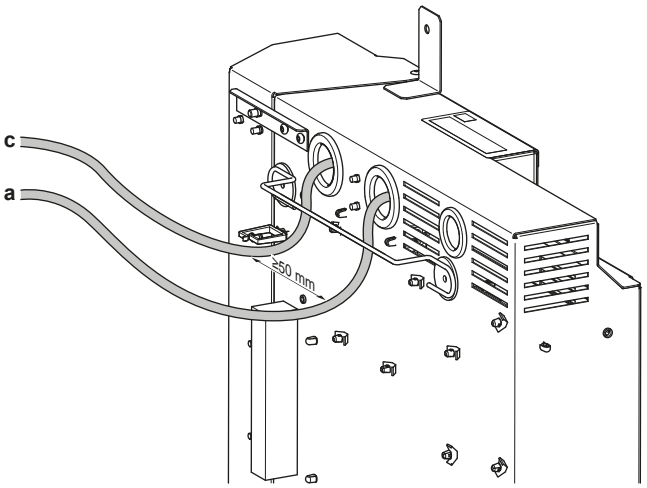
Foresee additional cable length of 35 cm for all wires which should be connected to X2M and X5M on sheet metal support above the hydro PCB. Additional wire length should be tie wrapped at the back side of the unit. Reason is to guarantee serviceability of, for example, the hydro PCB.

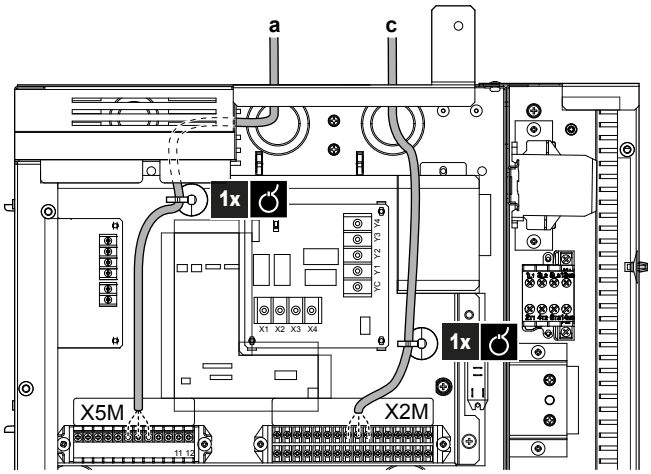
1 To open the indoor unit, see "7.2.2 To open the indoor unit" on page 24 and "7.2.3 To open the switch box cover of the indoor unit" on page 24.
2 Wiring should enter the unit from the top:

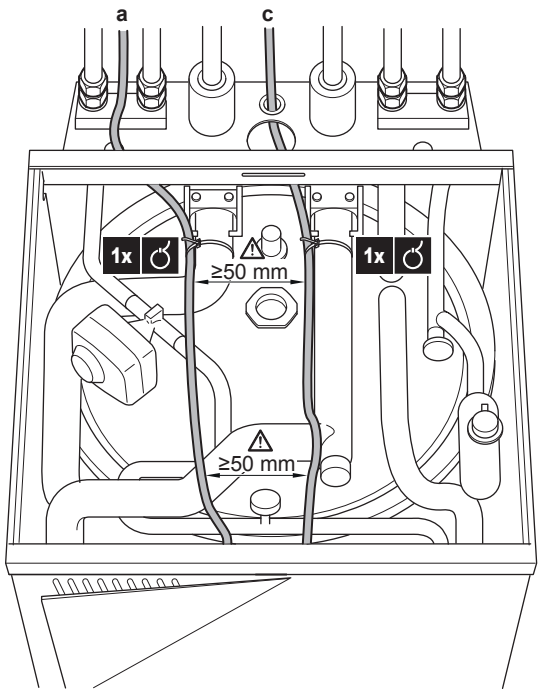


3 Routing of the wiring inside the unit should be as follows:









NOTICE

- Make sure that 50 mm is guaranteed between the low voltage (a) and high voltage (c) cables.
- Make sure that the cables (a) and (c) are routed between the wire guide and the backside of the switch box to prevent water ingress.

4 Fix the cable with cable ties to the cable tie mountings to ensure strain relief and to make sure that it does NOT come in contact with the piping and sharp edges.

Routing	Possible cables (depending on unit type and installed options)
a Low voltage	▪ User interface ▪ Power consumption digital inputs (field supply) ▪ Outdoor ambient temperature sensor ▪ Indoor ambient temperature sensor (option) ▪ Electrical meters (field supply)
b High voltage power supply	▪ Normal kWh rate power supply (power supply for unit)

Routing	Possible cables (depending on unit type and installed options)
c High voltage control signal	▪ Preferential kWh rate power supply ▪ Preferential power supply contact ▪ Heat pump convector (option) ▪ Room thermostat (option) ▪ Shut-off valve (field supply) ▪ Domestic hot water pump (field supply) ▪ Alarm output ▪ Changeover to external heat source control

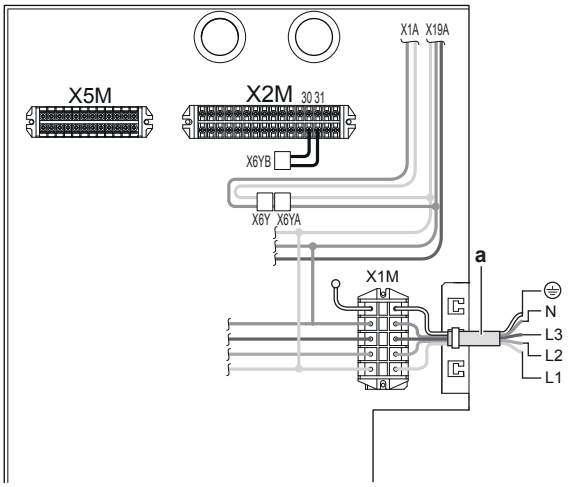
CAUTION

Do NOT push or place redundant cable length in the unit.

7.6.4 To connect the main power supply

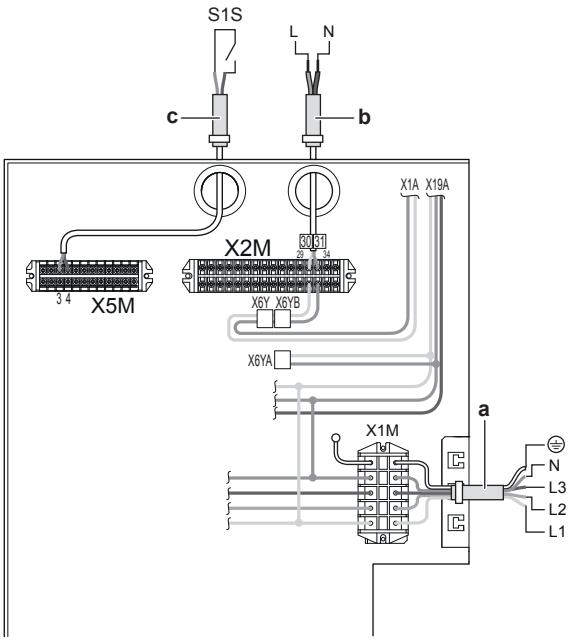
1 Connect the main power supply.

In case of normal kWh rate power supply



Legend: see illustration below.

In case of preferential kWh rate power supply



a Main power supply
b Normal kWh rate power supply
c Preferential power supply contact

2 Fix the cable with cable ties to the cable tie mountings.

INFORMATION

In case of preferential kWh rate power supply, the necessity of separate normal kWh rate power supply to indoor unit (b) X2M30/31 depends on the type of preferential kWh rate power supply.

Separate connection to the indoor unit is required:

- if preferential kWh rate power supply is interrupted when active, OR
- if no power consumption of the indoor unit is allowed at the preferential kWh rate power supply when active.

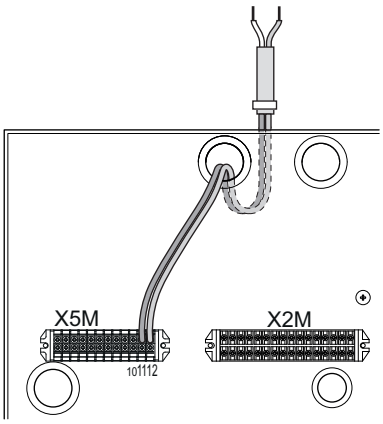
7.6.5 To connect the remote outdoor sensor

The remote outdoor sensor (delivered as accessory) measures the outdoor ambient temperature.

INFORMATION

If the desired leaving water temperature is weather dependent, the full time outdoor temperature measurement is important.

1 Connect the external temperature sensor cable to the indoor unit.

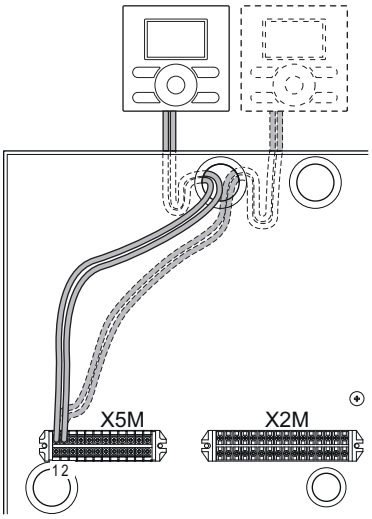


2 Fix the cable with cable ties to the cable tie mountings.

3 Install the remote outdoor sensor outside as described in the installation manual of the sensor (delivered as accessory).

7.6.6 To connect the user interface

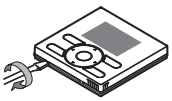
1 Connect the user interface cable to the indoor unit.



2 Fix the cable with cable ties to the cable tie mountings.

To fix the user interface to the unit

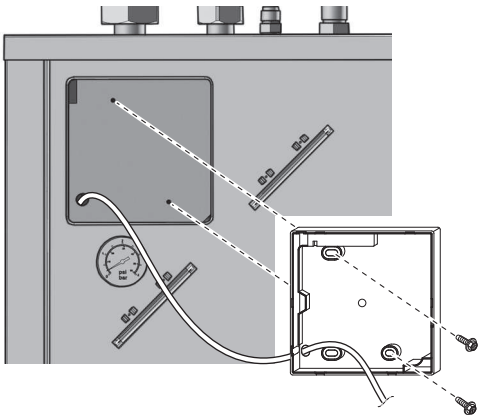
1 Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate.



NOTICE

The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it.

2 Fix the wallplate of the user interface to the frontplate of the unit.



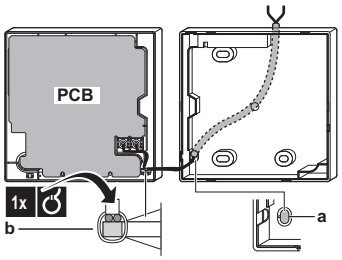
NOTICE

Be careful NOT to distort the shape of the backside of the user interface by overtightening the mounting screws.

3 Cut off a 2 wire conductor.

4 Connect the wires to the user interface as shown below.

From the rear



a Notch this part for the wiring to pass through with nippers etc.

b Secure the wiring to the front part of the casing using the wiring retainer and clamp.

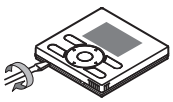
5 Reinstall the faceplate onto the wallplate.

NOTICE

Be careful NOT to pinch the wiring when attaching the frontplate to the unit.

To fix the user interface to the wall in case of installation as room thermostat

1 Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate.



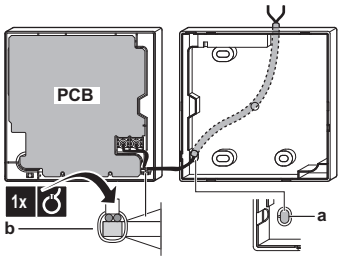
NOTICE

The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it.

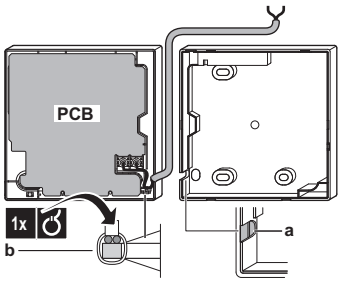
2 Fix the wallplate of the user interface to the wall.

3 Connect the wires to the user interface as shown below

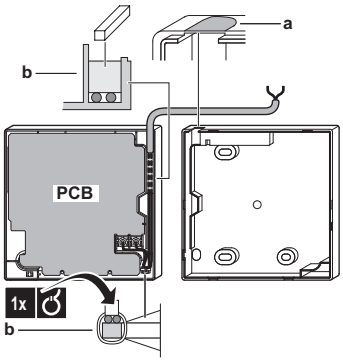
From the rear



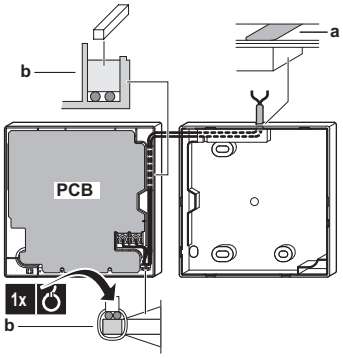
From the left



From the top



From the top center



a Notch this part for the wiring to pass through with nippers etc.

b Secure the wiring to the front part of the casing using the wiring retainer and clamp.

4 Reinstall the faceplate onto the wallplate.

NOTICE

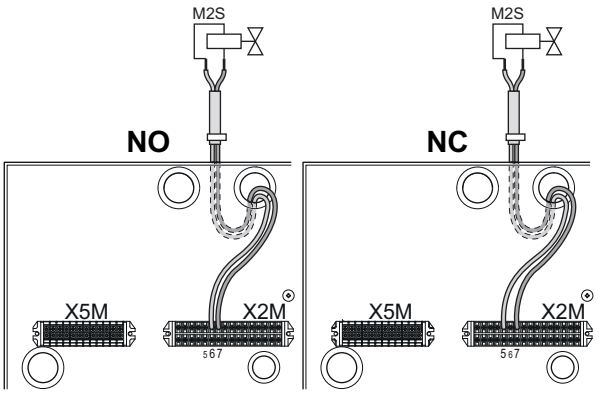
Be careful NOT to pinch the wiring when attaching the frontplate to the unit.

7.6.7 To connect the shut-off valve

1 Connect the valve control cable to the appropriate terminals as shown in the illustration below.

NOTICE

Wiring is different for a NC (normal closed) valve and a NO (normal open) valve.



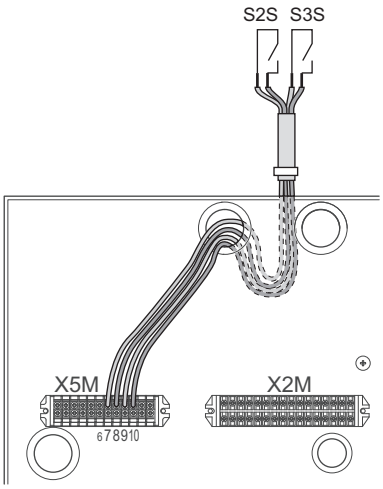
2 Fix the cable with cable ties to the cable tie mountings.

7.6.8 To connect the electrical meters

INFORMATION

In case of an electrical meter with transistor output, check the polarity. The positive polarity MUST be connected to X5M/7 and X5M/9; the negative polarity to X5M/8 and X5M/10.

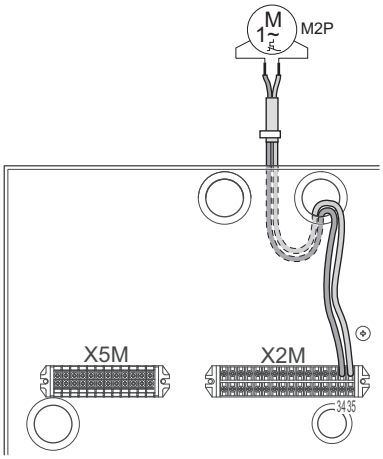
1 Connect the electrical meters cable to the appropriate terminals as shown in the illustration below.



2 Fix the cable with cable ties to the cable tie mountings.

7.6.9 To connect the domestic hot water pump

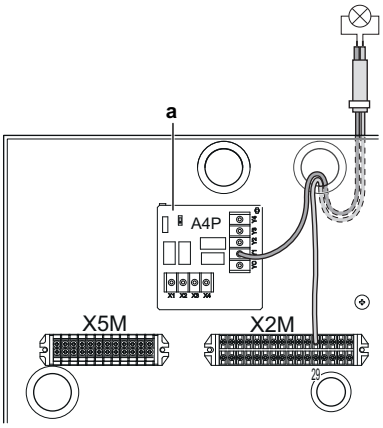
1 Connect the domestic hot water pump cable to the appropriate terminals as shown in the illustration below.



2 Fix the cable with cable ties to the cable tie mountings.

7.6.10 To connect the alarm output

1 Connect the alarm output cable to the appropriate terminals as shown in the illustration below.

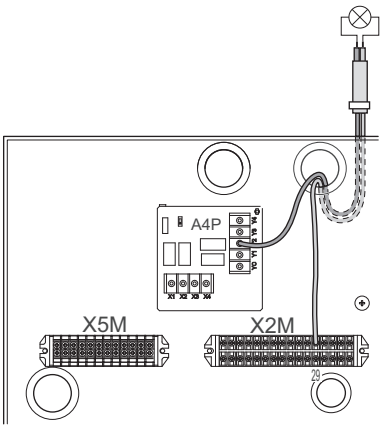


a Installation of EKRP1HB is required.

2 Fix the cable with cable ties to the cable tie mountings.

7.6.11 To connect the space heating ON/OFF output

1 Connect the space heating ON/OFF output cable to the appropriate terminals as shown in the illustration below.

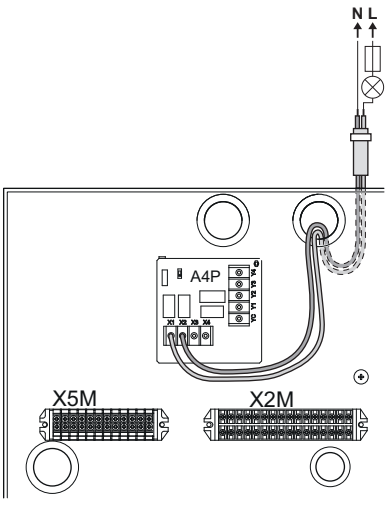


a Installation of EKRP1HB is required.

2 Fix the cable with cable ties to the cable tie mountings.

7.6.12 To connect the changeover to external heat source

1 Connect the changeover to external heat source cable to the appropriate terminals as shown in the illustration below.

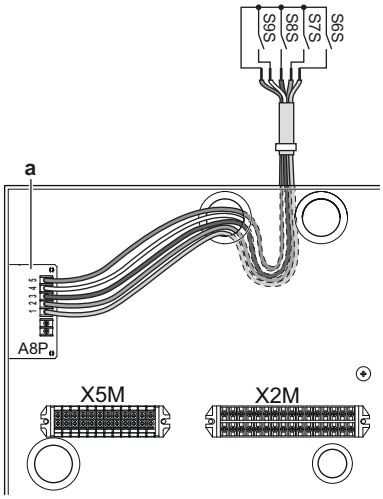


a Installation of EKRP1HB is required.

2 Fix the cable with cable ties to the cable tie mountings.

7.6.13 To connect the power consumption digital inputs

1 Connect the power consumption digital inputs cable to the appropriate terminals as shown in the illustration below.



a Installation of EKRP1AHTA is required.

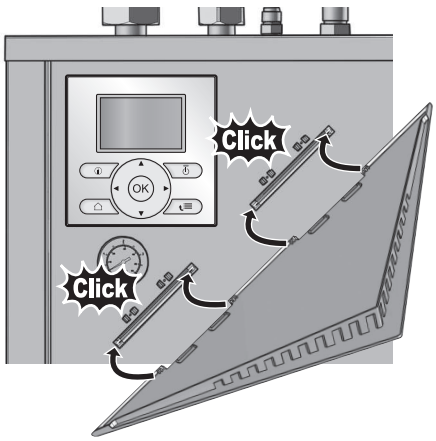
2 Fix the cable with cable ties to the cable tie mountings.

7.7 Finishing the indoor unit installation

7.7.1 To fix the user interface cover to the indoor unit

1 Make sure that the front panel is removed from the indoor unit. See "7.2.2 To open the indoor unit" on page 24.

2 Plug the user interface cover into the hinges.



3 Mount the front panel to the indoor unit.

7.7.2 To close the indoor unit

1 Close the switch box cover.

2 Reinstall the top plate.

3 Reinstall the front panel.

NOTICE

When closing the indoor unit cover, make sure that the tightening torque does NOT exceed 4.1 N•m.

8 Configuration

8.1 Overview: Configuration

This chapter describes what you have to do and know to configure the system after it is installed.

Why

If you do NOT configure the system correctly, it might NOT work as expected. The configuration influences the following:

- The calculations of the software
- What you can see on and do with the user interface

How

You can configure the system using two different methods.

Method	Description
Configuring via the user interface	**First time – Quick wizard.** When you turn ON the user interface for the first time (via the indoor unit), a quick wizard starts to help you configure the system. **Afterwards.** If necessary, you can make changes to the configuration afterwards.
Configuring via the PC configurator	You can prepare the configuration off-site on PC and afterwards upload the configuration to the system with the PC configurator. See also: "8.1.1 To connect the PC cable to the switch box" on page 36.

INFORMATION

When the installer settings are changed, the user interface will request to confirm. When confirmed, the screen will shortly turn OFF and "busy" will be displayed for several seconds.

Accessing settings – Legend for tables

You can access the installer settings using two different methods. However, NOT all settings are accessible via both methods. If so, the corresponding table columns in this chapter are set to N/A (not applicable).

Method	Column in tables
Accessing settings via the breadcrumb in the **menu structure**.	**#**
Accessing settings via the code in the **overview settings**.	**Code**

See also:

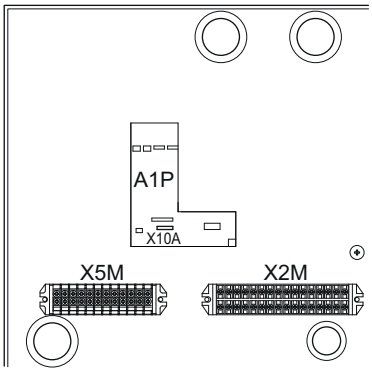
- "To access the installer settings" on page 36
- "8.5 Menu structure: Overview installer settings" on page 55

8.1.1 To connect the PC cable to the switch box

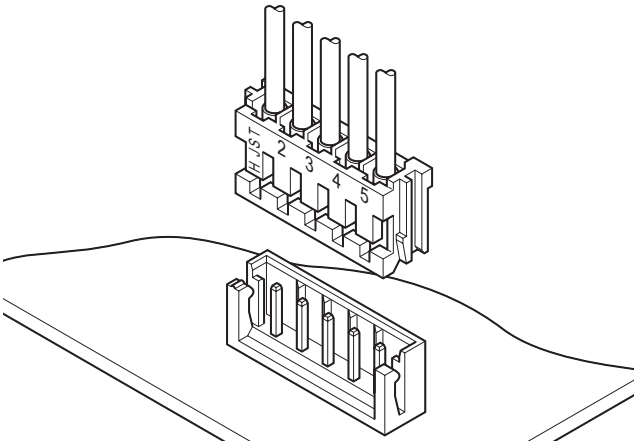
Prerequisite: The EKPCCAB kit is required.

1 Connect the cable with USB connection to your PC.

2 Connect the plug of the cable to X10A on A1P of the switch box of the indoor unit.



3 Pay special attention to the position of the plug!



8.1.2 To access the most used commands

To access the installer settings

1 Set the user permission level to Installer.

2 Go to [A]: ☰ > Installer settings.

To access the overview settings

1 Set the user permission level to Installer.

2 Go to [A.8]: ☰ > Installer settings > Overview settings.

To set the user permission level to Installer

1 Go to [6.4]: ☰ > Information > User permission level.

2 Press ☰ for more than 4 seconds.

Result: 🔧 is displayed on the home pages.

3 If you do NOT press any button for more than 1 hour or press ⓘ again for more than 4 seconds, the installer permission level switches back to End user.

To switch between user permission levels (End user and Advanced end user)

1 Go to [6] or any of its submenus: ☰ > Information.

2 Press ⓘ for more than 4 seconds.

Result: The user permission level switches to Adv. end user. Additional information is displayed and "+" is added to the menu title.

3 If you do NOT press any button for more than 1 hour or press ⓘ again for more than 4 seconds, the user permission level switches back to End user.

To modify an overview setting

Example: Modify [1-01] from 15 to 20.

1 Go to [A.8]: ☰ > Installer settings > Overview settings.

2 Go to the corresponding screen of the first part of the setting by using the ▲ and ▼ button.

INFORMATION

An additional 0-digit is added to the first part of the setting when you access the codes in the overview settings.

Example: [1-01]: "1" will result in "**0**1".

Overview settings				
		01		
00	01	15	02	03
04	05		06	07
08	09		0a	0b
0c	0d		0e	0f
OK Confirm		▲▼ Adjust		◀▶ Scroll

3 Go to the corresponding second part of the setting by using the ◀ and ▶ button.

Overview settings				
		01		
00	01	15	02	03
04	05		06	07
08	09		0a	0b
0c	0d		0e	0f
OK Confirm		▲▼ Adjust		◀▶ Scroll

Result: The value to be modified is now highlighted.

4 Modify the value by using the ▲ and ▼ button.

Overview settings				
		01		
00	01	20	02	03
04	05		06	07
08	09		0a	0b
0c	0d		0e	0f
OK Confirm		▲▼ Adjust		◀▶ Scroll

5 Push OK to confirm the modification of the parameter.

6 Repeat previous steps if you have to modify other settings.

7 Push the ⌂ or ☰ button to leave the overview settings menu.

8 Confirm by pressing OK.

Installer settings		
The system will restart.		
OK	Cancel	
OK Confirm	◀▶ Adjust	

8.1.3 To copy the system settings from the first to the second user interface

If a second user interface is connected, the installer must first proceed below instructions for the proper configuration of the 2 user interfaces.
This procedure offers you also the possibility to copy the language set from one user interface to the other one: e.g. from EKRUCBL2 to EKRUCBL1.

1 When power is turned on for the first time, both user interfaces display:

Tue 15:10
U5:Auto address
⏻ Push 4 sec. to continue ☼

2 Push ⏻ for 4 seconds on the user interface on which you want to proceed to the quick wizard. This user interface is now the main user interface.

INFORMATION

During the quick wizard, the second user interface displays Busy and will NOT be possible to operate.

3 The quick wizard will guide you.

4 For proper operation of the system, the local data on the two user interfaces must be the same. If this is NOT the case, both user interfaces will display:

Synchronization	
Data difference detected. Please select action:	
Send data	
OK Confirm	▲▼ Adjust

5 Select the required action:

- Send data: the user interface you are operating contains the correct data and the data on the other user interface will be overwritten.
- Receive data: the user interface you are operating does NOT contain the correct data and the data on the other user interface will be used to overwrite.

6 The user interface requests confirmation if you are sure to proceed.

Start copy	
Are you sure you want to start the copy operation?	
OK	Cancel
OK Confirm	◀▶ Adjust

7 Confirm the selection on the screen by pushing OK and all data (languages, schedules etc.) will be synchronised from the selected source user interface to the other one.

INFORMATION

- During the copying, both controllers display Busy and will NOT allow operation.
- The copy operation can take up until 90 minutes.
- It is recommended to change installer settings, or the configuration itself, on the main user interface.

8 Your system is now set to be operated by the 2 user interfaces.

8.1.4 To copy the language set from the first to the second user interface

See "8.1.4 To copy the system settings from the first to the second user interface" on page 38.

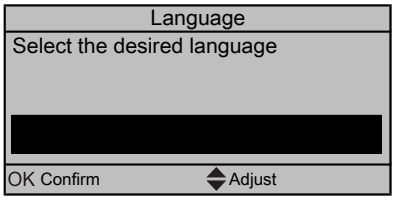
8.1.5 Quick wizard: Set the system layout after first power ON

After first power ON of the system, you are guided on the user interface to do initial settings:

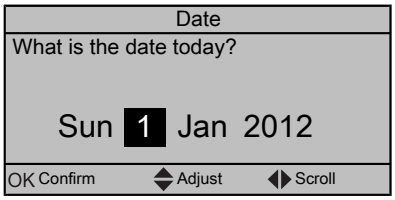
- language,
- date,
- time,
- system layout.

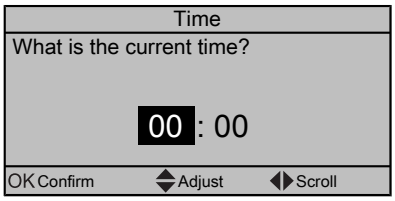
By confirming the system layout, you can proceed with the installation and commissioning of the system.

1 At power ON, the quick wizard starts as long as the system layout was NOT confirmed yet, by setting the language.

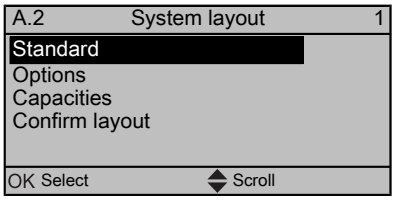


2 Set the current date and time.

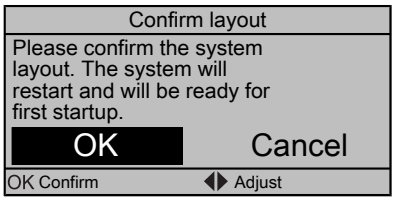




3 Set the system layout settings: Standard, Options, Capacities. For more details, see "8.2 Basic configuration" on page 38.



4 Confirm by pressing OK.



5 The user interface re-initialises and you can proceed the installation by setting the other applicable settings and commissioning of the system.

When the installer settings are changed, the system will request to confirm. When confirmation is complete, the screen will shortly turn OFF and "busy" will be displayed for several seconds.

8.2 Basic configuration

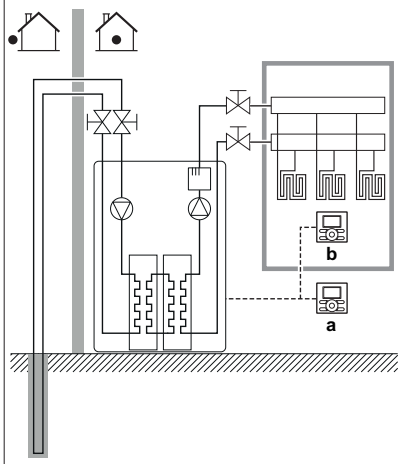
8.2.1 Quick wizard: Language / time and date

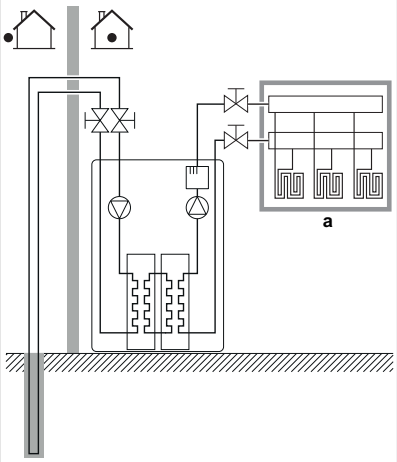
#	Code	Description
[A.1]	N/A	Language
[1]	N/A	Time and date

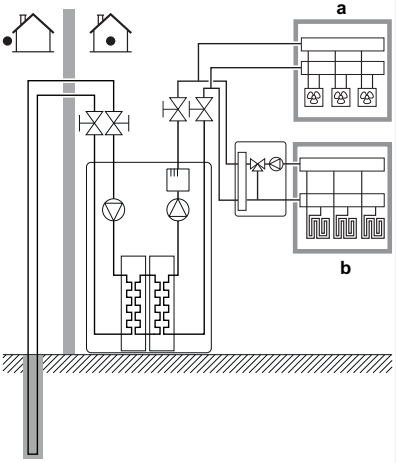
8.2.2 Quick wizard: Standard

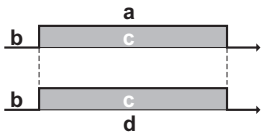
Space heating settings

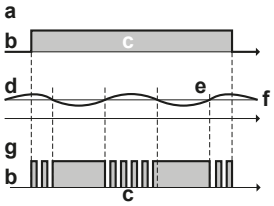
The system can heat up a space. Depending on the type of application, the space heating must be made accordingly.

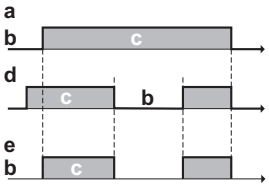
#	Code	Description
[A.2.1.7]	[C-07]	Unit control method: ▪ 0 (LWT control)(default): Unit operation is decided based on the leaving water temperature regardless the actual room temperature and/or heating demand of the room. ▪ 1 (Ext RT control): Unit operation is decided by the external thermostat or equivalent (e.g. heat pump convector). ▪ 2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
[A.2.1.B]	N/A	Only if there are 2 user interfaces (1 installed in the room, 1 installed at the indoor unit):  ▪ a: At unit ▪ b: In room as room thermostat User interface location: ▪ 0 (At unit): the other user interface is automatically set to In room and if RT control is selected act as room thermostat. ▪ 1 (In room)(default): the other user interface is automatically set to At unit and if RT control is selected to act as room thermostat.

#	Code	Description
[A.2.1.8]	[7-02]	The system can supply leaving water to up to 2 water temperature zones. During configuration, the number of water zones must be set. Number of LWT zones: ▪ 0 (1 LWT zone)(default): Only 1 leaving water temperature zone. This zone is called the main leaving water temperature zone.  ▪ a: Main LWT zone continued >>

#	Code	Description
[A.2.1.8]	[7-02]	<< continuation ▪ 1 (2 LWT zones): 2 leaving water temperature zones. The zone with the lowest leaving water temperature (in heating) is called the main leaving water temperature zone. The zone with the highest leaving water temperature (in heating) is called the additional leaving water temperature zone. In practice, the main leaving water temperature zone consists of the higher load heat emitters and a mixing station is installed to achieve the desired leaving water temperature.  ▪ a: Add LWT zone ▪ b: Main LWT zone

#	Code	Description
[A.2.1.9]	[F-0D]	When the space heating control is OFF by the user interface, the pump is always OFF. When the space heating control is On, you can select the desired pump operation mode (only applicable during space heating) Pump operation mode: ▪ 0 (Continuous): Continuous pump operation, regardless of thermo ON or OFF condition. **Remark:** continuous pump operation requires more energy than sample or request pump operation.  ▪ a: Space heating control (user interface) ▪ b: OFF ▪ c: On ▪ d: Pump operation continued >>

#	Code	Description
[A.2.1.9]	[F-0D]	<< continuation ▪ 1 (Sample)(default): The pump is ON. When there is heating demand as the leaving temperature has NOT reached the desired temperature yet. When thermo OFF condition occurs, the pump runs every 5 minutes to check the water temperature and demand heating if necessary. **Remark:** Sample is NOT available in extended room thermostat control or room thermostat control.  ▪ a: Space heating control (user interface) ▪ b: OFF ▪ c: On ▪ d: LWT temperature ▪ e: Actual ▪ f: Desired ▪ g: Pump operation continued >>

#	Code	Description
[A.2.1.9]	[F-0D]	<< continuation ▪ 2 (Request): Pump operation based on request. **Example:** Using a room thermostat creates thermo ON/OFF condition. When there is no such demand, the pump is OFF. **Remark:** Request is NOT available in leaving water temperature control.  ▪ a: Space heating control (user interface) ▪ b: OFF ▪ c: On ▪ d: Heating demand (by ext RT or RT) ▪ e: Pump operation

Brine freezing temperature

Depending on the type and concentration of the anti-freeze in the brine system, the freezing temperature will differ. The following parameters set the units freeze up prevention limit temperature. To allow for temperature measurement tolerances, the brine concentration MUST resist to a lower temperature than the defined setting.

General rule: the units freeze up prevention limit temperature MUST be 10°C lower than the minimum possible brine inlet temperature for the unit.

Example: When the minimum possible brine inlet temperature in a certain application is 0°C, then the unit freeze up prevention limit temperature MUST be set to –10°C or lower. Result will be that the brine mixture may NOT freeze above that temperature. To prevent freezing of the unit, check the type and concentration of the brine carefully.

#	Code	Description
[A.6.9]	[A-04]	Brine freezeup temp ▪ 0: 0°C ▪ 1: –2°C ▪ 2: –4°C ▪ 3: –6°C ▪ 4: –8°C ▪ 5: –10°C ▪ 6: –12°C ▪ 7 (default): –14°C

NOTICE

The setting brine freezing temperature can be modified and the read out is correct in [A.6.9] Brine freezeup temp ONLY after having accessed menu [A.8] Overview settings.

This setting can ONLY be modified and/or saved and the read out is ONLY correct if the communication between hydro module and compressor module is present. The communication between hydro module and compressor module is NOT guaranteed and/or applicable if:

- error "U4" appears on the user interface,
- the heat pump module is connected to preferential kWh rate power supply where power supply is interrupted and preferential kWh rate power supply is activated.

Capacity boost

For systems where higher capacity is required, the compressor frequency can be increased. Remark that higher capacity results in higher sound level.

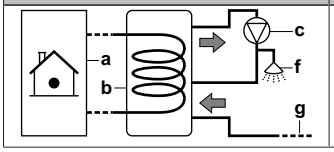
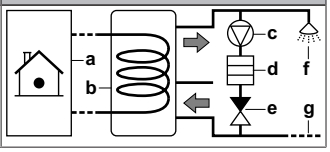
#	Code	Description
N/A	[A-03]	Compressor frequency ▪ 0 (default): normal ▪ 1: boost

8.2.3 Quick wizard: Options

Domestic hot water settings

Following settings must be made accordingly.

#	Code	Description
N/A	[E-05]	DHW operation: ▪ 0 (No): N/A ▪ 1 (Yes): Installed. Do NOT change this setting.
[A.2.2.A]	[D-02]	The indoor unit offers the possibility to connect a field supplied domestic hot water pump (On/OFF type). Depending on the installation and configuration on the user interface, we distinguish its functionality. DHW pump: ▪ 0 (No)(default): NOT installed. ▪ 1 (Secondary rtrn): Installed for instant hot water when water is tapped. The end-user sets the operation timing (weekly schedule time) of the domestic hot water pump when it should run. Control of this pump is possible through the indoor unit. ▪ 2 (Disinf. shunt): Installed for disinfection. It runs when the disinfection function of the domestic hot water tank is running. No further settings are needed. See also illustrations below.

Domestic hot water pump installed for…	
Instant hot water	Disinfection
	

a Indoor unit
b Tank
c Domestic hot water pump
d Heater element
e Non-return valve
f Shower
g Cold water

Thermostats and external sensors

NOTICE

If an external room thermostat is used, the external room thermostat will control the room frost protection. However, the room frost protection is only possible if the leaving water temperature control on the unit's user interface is turned ON.

See "5 Application guidelines" on page 8.

#	Code	Description
[A.2.2.4]	[C-05]	Contact type main In external room thermostat control, the contact type of the optional room thermostat or heat pump convector for the main leaving water temperature zone must be set. See "5 Application guidelines" on page 8. ▪ 1 (Thermo ON/OFF): The connected external room thermostat or heat pump convector sends the heating demand by the same signal as it is connected to only 1 digital input (preserved for the main leaving water temperature zone) on the indoor unit (X2M/1). Select this value in case of a connection to the heat pump convector (FWXV).
[A.2.2.5]	[C-06]	Contact type add. In external room thermostat control with 2 leaving water temperature zones, the type of the optional room thermostat for the additional leaving water temperature zone must be set. See "5 Application guidelines" on page 8. ▪ 1 (Thermo ON/OFF): See Contact type main. Connected on the indoor unit (X2M/1a).
[A.2.2.B]	[C-08]	External sensor When an optional external ambient sensor is connected, the type of the sensor must be set. See "5 Application guidelines" on page 8. ▪ 0 (No)(default): NOT installed. The thermistor in the user interface and in the heat pump module are used for measurement. ▪ 2 (Room sensor): Installed. The temperature sensor in the user interface is NOT used anymore. **Remark:** This value has only meaning in room thermostat control.

Digital I/O PCB

Modification of these settings is only needed when the optional digital I/O PCB is installed. The digital I/O PCB has multiple functionality which need to be configured. See "5 Application guidelines" on page 8.

#	Code	Description
[A.2.2.6.1]	[C-02]	Ext. backup heat src Indicates if the space heating is also performed by means of an other heat source than the system. ▪ 0 (No)(default): NOT installed. ▪ 1 (Bivalent): Installed. The auxiliary boiler (gasboiler, oil burner) will operate when the outdoor ambient temperature is low. During the bivalent operation, the heat pump is turned OFF. Set this value in case an auxilillary boiler is used. See "5 Application guidelines" on page 8.
[A.2.2.6.3]	[C-09]	Alarm output Indicates the logic of the alarm output on the digital I/O PCB during malfunctioning. ▪ 0 (Normally open)(default): The alarm output will be powered when an alarm occurs. By setting this value, a distinction is made between malfunctioning and detection of a power failure of the unit. ▪ 1 (Normally closed): The alarm output will NOT be powered when an alarm occurs.

Alarm output logic

[C-09]	Alarm	No alarm	No power supply to unit
0 (default)	Closed output	Open output	Open output
1	Open output	Closed output	

Demand PCB

The demand PCB is used to enable the power consumption control by digital inputs. See "5 Application guidelines" on page 8.

#	Code	Description
[A.2.2.7]	[D-04]	Demand PCB Indicates if the optional demand PCB is installed. ▪ 0 (No)(default): NOT installed. ▪ 1 (Yes): Installed. Power consumption control by digital inputs is selectable in [A.6.2.1].

Energy metering

When energy metering is performed by the use of external power meters, configure the settings as described below. Select the pulse frequency output of each power meter in accordance with the power meter specifications. It is possible to connect (up to 2) power meters with different pulse frequencies. When only 1 or no power meter is used, select No to indicate the corresponding pulse input is NOT used.

#	Code	Description
[A.2.2.8]	[D-08]	Optional external kWh meter 1: ▪ 0 (No): NOT installed ▪ 1: Installed (0.1 pulse/kWh) ▪ 2: Installed (1 pulse/kWh) ▪ 3: Installed (10 pulse/kWh) ▪ 4: Installed (100 pulse/kWh) ▪ 5: Installed (1000 pulse/kWh)

#	Code	Description
[A.2.2.9]	[D-09]	Optional external kWh meter 2: ▪ 0 (No): NOT installed ▪ 1: Installed (0.1 pulse/kWh) ▪ 2: Installed (1 pulse/kWh) ▪ 3: Installed (10 pulse/kWh) ▪ 4: Installed (100 pulse/kWh) ▪ 5: Installed (1000 pulse/kWh)

8.2.4 Quick wizard: Capacities (energy metering)

The capacities of all electrical heaters must be set for the energy metering and/or power consumption control feature to work properly. When measuring the resistance value of each heater, you can set the exact heater capacity and this will lead to more accurate energy data.

#	Code	Description
[A.2.3.2]	[6-03]	BUH: step 1: The capacity of the first step of the backup heater at nominal voltage. Nominal value 3 kW. Default: 3 kW. 0~10 kW (in steps of 0.2 kW)
[A.2.3.3]	[6-04]	BUH: step 2: The capacity difference between the second and first step of the backup heater. Default: 3 kW. 0~10 kW (in steps of 0.2 kW)

8.2.5 Space heating control

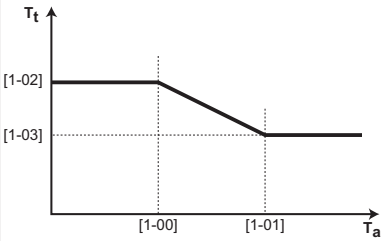
The basic required settings in order to configure the space heating of your system are described in this chapter. The weather-dependent installer settings define the parameters for the weather-dependent operation of the unit. When weather-dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature. Low outdoor temperatures will result in warmer water and vice versa. During weather-dependent operation, the user has the possibility to shift up or down the target water temperature by a maximum of 5°C.

See the user reference guide and/or operation manual for more details about this function.

Leaving water temperature: Main zone

#	Code	Description
[A.3.1.1.1]	N/A	LWT setpoint mode: ▪ Fixed: The desired leaving water temperature is: ▪ NOT weather-dependent (i.e. does NOT depend on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) ▪ Weather dep. (default): The desired leaving water temperature is: ▪ weather-dependent (i.e. depends on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) continued >>

#	Code	Description
[A.3.1.1.1]	N/A	<< continuation ▪ Fixed/scheduled: The desired leaving water temperature is: ▪ NOT weather-dependent (i.e., does NOT depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions consists of desired shift actions, either preset or custom. **Remark:** This value can only be set in leaving water temperature control. ▪ WD/scheduled: The desired leaving water temperature is: ▪ weather-dependent (i.e., does depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions consists of desired leaving water temperatures either preset or custom **Remark:** This value can only be set in leaving water temperature control.

#	Code	Description
[A.3.1.1.3]	[1-00] [1-01] [1-02] [1-03]	Set weather-dependent heating:  ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature continued >>

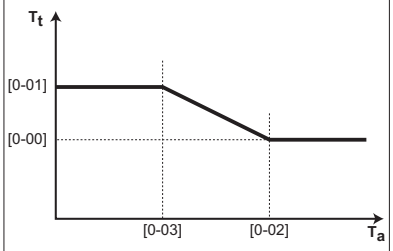
#	Code	Description
[A.3.1.1.3]	[1-00] [1-01] [1-02] [1-03]	<< continuation ▪ [1-00]: Low outdoor ambient temperature. −20°C~5°C (default: −20°C) ▪ [1-01]: High outdoor ambient temperature. 10°C~20°C (default: 15°C) ▪ [1-02]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. Between minimum and maximum leaving water temperature (default: 60°C). **Note:** This value should be higher than [1-03] as for low outdoor temperatures warmer water is required. ▪ [1-03]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. Between minimum and maximum leaving water temperature (default: 25°C). **Note:** This value should be lower than [1-02] as for high outdoor temperatures less warm water is required.

Leaving water temperature: Additional zone

Only applicable if 2 leaving water temperature zones are present.

#	Code	Description
[A.3.1.2.1]	N/A	LWT setpoint mode: ▪ Fixed: The desired leaving water temperature is: ▪ NOT weather-dependent (i.e. does NOT depend on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) ▪ Weather dep. (default): The desired leaving water temperature is: ▪ weather-dependent (i.e. depends on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) continued >>

#	Code	Description
[A.3.1.2.1]	N/A	<< continuation ▪ Fixed/scheduled: The desired leaving water temperature is: ▪ NOT weather-dependent (i.e., does NOT depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions are On or OFF. **Remark:** This value can only be set in leaving water temperature control. ▪ WD/scheduled: The desired leaving water temperature is: ▪ weather-dependent (i.e., does depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions are On or OFF. **Remark:** This value can only be set in leaving water temperature control.

#	Code	Description
[A.3.1.2.3]	[0-00] [0-01] [0-02] [0-03]	Set weather-dependent heating:  ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature continued >>

#	Code	Description
[A.3.1.2.3]	[0-00] [0-01] [0-02] [0-03]	<< continuation ▪ [0-03]: Low outdoor ambient temperature. −20°C~5°C (default: −20°C) ▪ [0-02]: High outdoor ambient temperature. 10°C~20°C (default: 15°C) ▪ [0-01]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. Between minimum and maximum leaving water temperature 25°C~65°C (default: 60°C). **Note:** This value should be higher than [0-00] as for low outdoor temperatures warmer water is required. ▪ [0-00]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. Between minimum and maximum leaving water temperature 25°C~65°C (default: 25°C). **Note:** This value should be lower than [0-01] as for high outdoor temperatures less warm water is required.

Leaving water temperature: Delta T emitter

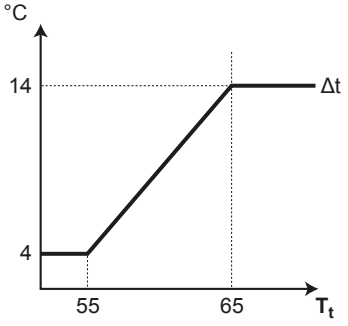
Temperature difference for entering and leaving water. The unit is designed to support under floor loops operation. The recommended leaving water temperature (set by the user interface) for under floor loops is 35°C. In such case, the unit will be controlled to realize a temperature difference of 5°C which means that the entering water to the unit is around 30°C. Depending on the installed application (radiators, heat pump convector, under floor loops) or situation, it can be possible to change the difference between entering and leaving water temperature. Note that the pump will regulate its flow to keep the Δt.

#	Code	Description
[A.3.1.3.1]	[9-09]	Heating: required temperature difference between entering and leaving water. Range: 3~10°C (in steps of 1°C; default value: 8°C).

Specific for installations that require higher water temperatures (e.g., radiators)

For leaving water temperature set point>55°C

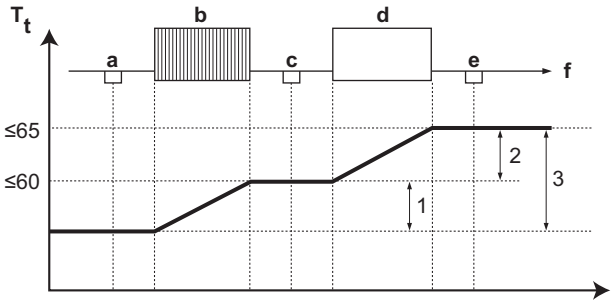
As soon as the leaving water temperature set point is >55, Δt is no longer a constant determined by field setting [9-09] (default 5K), but linear in function of the set point.



Δt Temperature difference
T_t Target leaving water temperature (main)

For leaving water temperature set point>60°C

Up to leaving water temperature set point 60°C, the heat pump can cover this temperature. If you need a leaving water temperature set points >60°C, the backup heater will assist to reach the requested temperature. Assistance by backup heater is ONLY possible when the ambient temperature is lower than the equilibrium temperature.



a Water from heat emitters
b Condenser
c Leaving water from condenser
d Backup heater
e Leaving water
f Water flow
1 By heat pump
2 By backup heater
3 Temperature difference
T_t Target leaving water temperature (main)

To minimize the power consumption, the heat pump ALWAYS tries to reach max possible target leaving water temperature of 60°C. The remaining part is done by the backup heater.

Leaving water temperature: Modulation

Only applicable in case of room thermostat control. When using the room thermostat functionality, the customer needs to set the desired room temperature. The unit will supply hot water to the heat emitters and the room will be heated. Additionally, also the desired leaving water temperature must be configured: when turning on the modulation, the desired leaving water temperature will be calculated automatically by the unit (based on the preset temperatures, if weather-dependent is selected, modulation will be done based on the desired weather-dependent temperatures); when turning off the modulation, you can set the desired leaving water temperature on the user interface. Moreover, with the modulation turned on, the desired leaving water temperature is lowered or raised in function of the desired room temperature and the difference between the actual and the desired room temperature. This results in:

- stable room temperatures exactly matching the desired temperature (higher comfort level)
- less On/OFF cycles (lower noise level, higher comfort and higher efficiency)
- water temperatures as low as possible to match the desired temperature (higher efficiency)

#	Code	Description
[A.3.1.1.5]	[8-05]	Modulated LWT: ▪ No (default): disabled. **Note:** The desired leaving water temperature needs to be set on the user interface. ▪ Yes: enabled. **Note:** The desired leaving water temperature can only be read out on the user interface

Leaving water temperature: Emitter type

Only applicable in case of room thermostat control. Depending on the system water volume and the heat emitters type, the heat up of a space can take longer. This setting can compensate for a slow or a quick heating system during the heat up cycle.

Note: The setting of the emitter type will influence the maximum modulation of the desired leaving water temperature and the possibility for usage of the automatic heating changeover based on the indoor ambient temperature.

Therefore it is important to set this correctly.

#	Code	Description
[A.3.1.1.7]	[9-0B]	Emitter type: Reaction time of the system: ▪ 0 (Quick)(default) **Example:** Small water volume and fan coils. ▪ 1 (Slow) **Example:** Large water volume, floor heating loops.

8.2.6 Domestic hot water control

Only applicable in case an optional domestic hot water tank is installed.

Configuring the desired tank temperature

The domestic hot water can be prepared in 3 different ways. They differ from each other by the way the desired tank temperature is set and how the unit acts upon it.

#	Code	Description
[A.4.1]	[6-0D]	Domestic hot water Type: ▪ 0 (Reheat only): Only reheat operation is allowed. ▪ 1 (Reheat + sched.)(default): The domestic hot water tank is heated according to a schedule and between the scheduled heatup cycles, reheat operation is allowed. ▪ 2 (Scheduled only): The domestic hot water tank can ONLY be heated according to a schedule.

See "8.3.2 Domestic hot water control: advanced" on page 48 for more details.

INFORMATION

It is recommended NOT to use the selection of ([6-0D]=0, [A.4.1] Domestic hot water Type=Reheat only).

The risk of space heating capacity shortage/comfort problems is significant (in case of frequent domestic hot water operation, frequent and long space heating interruption will happen).

Readout the desired tank temperature

The desired tank temperature is displayed on the user interface. By the following settings, you can configure the way the tank temperature is displayed:

- by its numerical value
- by an equivalent.

Use the numerical value in case the understanding of tank temperature is clear for the customer. On the user interface the customer can set the desired tank temperature per 1°C. For customers with less feeling about tank temperatures, choose display by equivalent number of people. They will set the desired tank temperature by indicating their domestic hot water consumption as a number of people.

As installer, you configure the conversion between the equivalent domestic hot water consumption per person at 1 heat-up cycle and the real desired tank temperature. Please take into account the installed tank size. Additionally, using the graphical display, the customer is made aware about the amount of consumed domestic hot water.

#	Code	Description
[A.4.3.1]	N/A	How is the tank temperature to be displayed on the user interface? ▪ As temperature. 60°C ▪ As graphic: The temperature has to be displayed as available hot water for x persons. If you choose this, you also have to configure which number equals which temperature under [A.4.3.2.1]~[A.4.3.2.6]: 4
[A.4.3.2.1]	N/A	1 person The absolute desired tank temperature for 1 person. 30~80°C (default: 42°C)
[A.4.3.2.2]	N/A	2 persons The increment of the desired tank temperature for 2 persons compared to 1 person. 0~20°C (default: 6°C)
[A.4.3.2.3]	N/A	3 persons The increment of the desired tank temperature for 3 persons compared to 2 persons. 0~20°C (default: 15°C)
[A.4.3.2.4]	N/A	4 persons The increment of the desired tank temperature for 4 persons compared to 3 persons. 0~20°C (default: 17°C)
[A.4.3.2.5]	N/A	5 persons The increment of the desired tank temperature for 5 persons compared to 4 persons. 0~20°C (default: 1°C)
[A.4.3.2.6]	N/A	6 persons The increment of the desired tank temperature for 6 persons compared to 5 persons. 0~20°C (default: 1°C)

INFORMATION

The real desired tank temperature is defined by the selected absolute desired tank temperature and the number of persons + selected increment value(s).

Example: 3 persons (default settings)

Real desired tank temperature=[A.4.3.2.1] + [A.4.3.2.2] + [A.4.3.2.3]

Real desired tank temperature=42+6+15=63°C.

Maximum DHW temperature setpoint

The maximum temperature that users can select for the domestic hot water. You can use this setting to limit the temperatures at the hot water taps.

INFORMATION

During disinfection of the domestic hot water tank, the DHW temperature can exceed this maximum temperature.

INFORMATION

Limit the maximum hot water temperature according to the applicable legislation.

#	Code	Description
[A.4.5]	[6-0E]	Maximum setpoint The maximum temperature that users can select for the domestic hot water. You can use this setting to limit the temperature at the hot water taps. If ▪ [E-07]=1: 40~60°C (default: 60°C) The maximum temperature is NOT applicable during disinfection function. See disinfection function.

8.2.7 Contact/helpdesk number

#	Code	Description
[6.3.2]	N/A	Number that users can call in case of problems.

8.3 Advanced configuration/ optimization

8.3.1 Space heating operation: advanced

Preset leaving water temperature

You can define preset leaving water temperatures:

- economic (denotes the desired leaving water temperature which results in the lowest energy consumption)
- comfort (denotes the desired leaving water temperature which results in the highest energy consumption).

Preset values make it easy to use the same value in the schedule or to adjust the desired leaving water temperature according to the room temperature (see modulation). If you later want to change the value, you only have to do it in one place. Depending on whether the desired leaving water temperature is weather dependent or not, the absolute desired leaving water temperature should be specified or the desired shift values.

NOTICE

The preset leaving water temperatures are ONLY applicable for the main zone, as the schedule for the additional zone consists of On/OFF actions.

NOTICE

Select preset leaving water temperatures in accordance with the design and selected heat emitters to ensure the balance between desired room and leaving water temperatures.

#	Code	Description
Preset leaving water temperature for the main leaving water temperature zone in case of NOT weather dependent		
[7.4.2.1]	[8-09]	Comfort (heating) [9-01]~[9-00] (default: 55°C)
[7.4.2.2]	[8-0A]	Eco (heating) [9-01]~[9-00] (default: 45°C)
Preset leaving water temperature (shift value) for the main leaving water temperature zone in case of weather dependent		
[7.4.2.5]	N/A	Comfort (heating) −10~+10°C (default: 0°C)
[7.4.2.6]	N/A	Eco (heating) −10~+10°C (default: −2°C)

Temperature ranges (leaving water temperatures)

The purpose of this setting is to prevent selecting a wrong (i.e. too hot) leaving water temperature. Thereto the available desired heating temperature range can be configured.

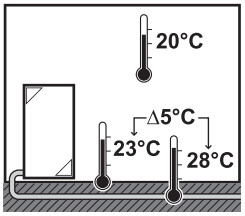
NOTICE

In case of a floor heating application it is important to limit the maximum leaving water temperature at heating operation according to the specifications of the floor heating installation.

NOTICE

- When adjusting the leaving water temperature ranges, all desired leaving water temperatures are also adjusted to guarantee they are between the limits.
- Always balance between the desired leaving water temperature with the desired room temperature and/or the capacity (according to the design and selection of the heat emitters). The desired leaving water temperature is the result of several settings (preset values, shift values, weather dependent curves, modulation). As a result, too high or too low leaving water temperatures could occur which lead to overtemperatures or capacity shortage. By limiting the leaving water temperature range to adequate values (depending on the heat emitter), such situations can be avoided.

Example: Set the minimum leaving water temperature to 28°C to avoid NOT to be able to heat up the room: leaving water temperatures must be sufficiently higher than the room temperatures (in heating).



#	Code	Description
Leaving water temperature range for the main leaving water temperature zone (= the leaving water temperature zone with the lowest leaving water temperature in heating operation)		
[A.3.1.1.2.2]	[9-00]	Maximum temp (heating) 37~65°C (default: 65°C)
[A.3.1.1.2.1]	[9-01]	Minimum temp (heating) 15~37°C (default: 24°C)
Leaving water temperature range for the additional leaving water temperature zone (= the leaving water temperature zone with the highest leaving water temperature in heating operation)		
[A.3.1.2.2.2]	[9-06]	Maximum temp (heating) 37~65°C (default: 65°C)
[A.3.1.2.2.1]	[9-05]	Minimum temp (heating) 15~37°C (default: 24°C)

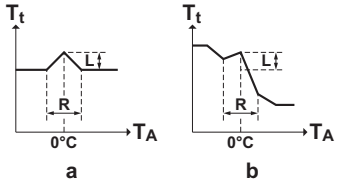
Leaving water temperature overshoot temperature

This function defines how much the water temperature may rise above the desired leaving water temperature before the compressor stops. The compressor will startup again when the leaving water temperature drops below the desired leaving water temperature.

#	Code	Description
N/A	[9-04]	1~4°C (default: 1°C)

Leaving water temperature compensation around 0°C

In heating operation, the desired leaving water temperature is locally increased around an outdoor temperature of 0°C. This compensation can be selected when using an absolute or a weather dependent desired temperature, this compensation can be selected (see illustration below). Use this setting to compensate for possible heat losses of the building when the outdoor temperature is around 0°C (e.g. in cold region countries).



a Absolute desired LWT
b Weather dependent desired LWT

#	Code	Description
N/A	[D-03]	▪ 0 (disabled) (default) ▪ 1 (enabled) L=2°C, R=4°C (−2°C<T_A<2°C) ▪ 2 (enabled) L=4°C, R=4°C (−2°C<T_A<2°C) ▪ 3 (enabled) L=2°C, R=8°C (−4°C<T_A<4°C) ▪ 4 (enabled) L=4°C, R=8°C (−4°C<T_A<4°C)

Leaving water temperature maximum modulation

Only applicable in room thermostat control and when modulation is enabled. The maximum modulation (=variance) on the desired leaving water temperature decided on the difference between the actual and desired room temperature, e.g. 3°C modulation means the desired leaving water temperature can be increased or lowered by 3°C. Increasing the modulation results in better performance (less On/OFF, faster heat up), but note that depending on the heat emitter, there must always be a balance (refer to the design and selection of the heat emitters) between the desired leaving water temperature and the desired room temperature.

#	Code	Description
N/A	[8-06]	1~5°C (default: 3°C)

Temperature ranges (room temperature)

Only applicable in room thermostat control. In order to save energy by preventing overheating the room, you can limit the range of the room temperature.

NOTICE

When adjusting the room temperature ranges, all desired room temperatures are also adjusted to guarantee they are between the limits.

#	Code	Description
Room temp. range		
[A.3.2.1.2]	[3-06]	Maximum temp (heating) 18~30°C (default: 30°C)
[A.3.2.1.1]	[3-07]	Minimum temp (heating) 12~18°C (default: 12°C)

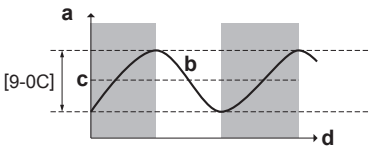
Room temperature step

Only applicable in room thermostat control and when the temperature is displayed in °C.

#	Code	Description
[A.3.2.4]	N/A	Room temp. step ▪ 1°C (default). The desired room temperature on the user interface is settable per 1°C. ▪ 0.5°C The desired room temperature on the user interface is settable per 0.5°C. The actual room temperature is displayed with an accuracy of 0.1°C.

Room temperature hysteresis

Only applicable in case of room thermostat control. The hysteresis band around the desired room temperature is settable. Daikin advises NOT to change the room temperature hysteresis as it is set for an optimal use of the system.



a Room temperature
b Actual room temperature
c Desired room temperature
d Time

#	Code	Description
N/A	[9-0C]	1~6°C (default: 1°C)

Room temperature offset

Only applicable in case of room thermostat control. You can calibrate the (external) room temperature sensor. It is possible to give an offset to the room thermistor value measured by the user interface or by the external room sensor. The settings can be used to compensate for situations where the user interface or external room sensor cannot be installed on the ideal installation location (see installation manual and/or installer reference guide).

#	Code	Description
Room temp. offset: Offset on the actual room temperature measured on the user interface sensor.		
[A.3.2.2]	[2-0A]	−5~5°C, step 0.5°C (default: 0°C)
Ext. room sensor offset: Only applicable if the external room sensor option is installed and configured (see [C-08])		
[A.3.2.3]	[2-09]	−5~5°C, step 0.5°C (default: 0°C)

Room frost protection

Only applicable in case of room thermostat control. When the actual room temperature would drop below the room frost temperature, the unit will supply leaving water to the heat emitters to heat up the room again.

NOTICE

Even if the room thermostat control is OFF on the user interface, room frost protection remains active.

NOTICE

If Auto emergency operation is set to Manual ([A.5.1.2]=0), and the unit is triggered to start emergency operation, the user interface will ask confirmation before starting. If the user does NOT confirm, the room frost protection will NOT be activated.

#	Code	Description
N/A	[2-06]	Room frost protection ▪ 0: disabled ▪ 1: enabled (default)
N/A	[2-05]	Room antifrost temperature 4~16°C (default: 12°C)

Shut-off valve

Only applicable in case of 2 leaving water temperature zones.

The shut-off valve, which is in the main leaving water temperature zone, output is configurable.

Thermo On/OFF: the valve closes, depending on [F-0B] when there is no heating and/or demand of the room in the main zone. Enable this setting to:

- avoid leaving water supply to the heat emitters in the main LWT zone (through the mixing valve station) when there is request from the additional LWT zone.
- activate the On/OFF pump of the mixing valve station only when there is demand. See "5 Application guidelines" on page 8.

#	Code	Description
[A.3.1.1.6.1]	[F-0B]	The shut-off valve: ▪ 0 (No)(default): is NOT influenced by heating demand. ▪ 1 (Yes): closes when there is NO heating demand.

INFORMATION

The setting [F-0B] is only valid when there is a thermostat or external room thermostat request setting (NOT in case of leaving water temperature setting).

Operation range

Depending on the average outdoor temperature, the operation of the unit in space heating is prohibited.

Space heating OFF temp: When the averaged outdoor temperature raises above this value, space heating is turned OFF to avoid overheating.

#	Code	Description
[A.3.3.1]	[4-02]	14~35°C (default: 35°C)

8.3.2 Domestic hot water control: advanced

Preset tank temperatures

Only applicable when domestic hot water preparation is scheduled or scheduled + reheat.

You can define preset tank temperatures:

- storage economic
- storage comfort
- reheat
- reheat hysteresis

Preset values make it easy to use the same value in the schedule. If you later want to change the value, you only have to do it in 1 place (see also operation manual and/or user reference guide).

Storage comfort: When programming the schedule, you can make use of the tank temperatures set as preset values. The tank will then heat up until these setpoint temperatures have been reached. Additionally, a storage stop can be programmed. This feature puts a stop to tank heating even if the setpoint has NOT been reached. Only program a storage stop when tank heating is absolutely undesirable.

#	Code	Description
[7.4.3.1]	[6-0A]	30~60°C (default: 60°C)

Storage eco: The storage economic temperature denotes the lower desired tank temperature. It is the desired temperature when a storage economic action is scheduled (preferably during day).

#	Code	Description
[7.4.3.2]	[6-0B]	30~50°C (default: 45°C)

Reheat: The desired reheat tank temperature is used:

- in reheat mode or scheduled + reheat mode: The guaranteed minimum tank temperature is set by [6-0C]–[6-08], which is the reheat temperature minus the reheat hysteresis. If the tank temperature drops below this value, the tank is heated up.

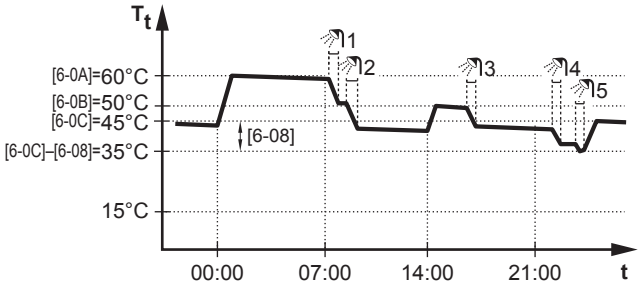
#	Code	Description
[7.4.3.3]	[6-0C]	30~50°C (default: 45°C)

Reheat hysteresis

Only applicable when domestic hot water preparation is scheduled + reheat.

In reheat operation, the tank will be heated up to reheat setpoint. The tank will only start heating if the tank temperature drops below the hysteresis value.

#	Code	Description
N/A	[6-08]	2~20°C (default: 10°C)

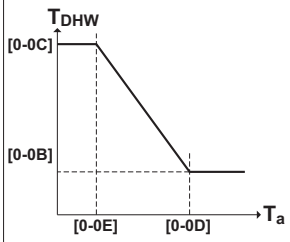


T_t DHW tank temperature
t Time
[6-0A] Storage comfort
[6-0B] Storage eco
[6-0C] Reheat
[6-08] Reheat hysteresis

Weather dependent

The weather dependent installer settings define the parameters for the weather dependent operation of the unit. When weather dependent operation is active the desired tank temperature is determined automatically depending on the averaged outdoor temperature: low outdoor temperatures will result in higher desired tank temperatures as the cold water tap is colder and vice versa. In case of scheduled or scheduled+reheat domestic hot water preparation, the storage comfort temperature is weather dependent (according to the weather dependent curve), the storage economic and reheat temperature are NOT weather dependent. In case of reheat only domestic hot water preparation, the desired tank temperature is weather dependent (according to the weather dependent curve). During weather dependent operation, the end-user cannot adjust the desired tank temperature on the user interface.

#	Code	Description
[A.4.6]	N/A	Desired temperature mode: ▪ Fixed (default): disabled. All desired tank temperature are NOT weather dependent. ▪ Weather dep.: enabled. In scheduled or scheduled+reheat mode, the storage comfort temperature is weather dependent. Storage economic and reheat temperatures are NOT weather dependent. In reheat mode, the desired tank temperature is weather dependent. **Note:** When the displayed tank temperature is weather dependent, it cannot be adjusted on the user interface.

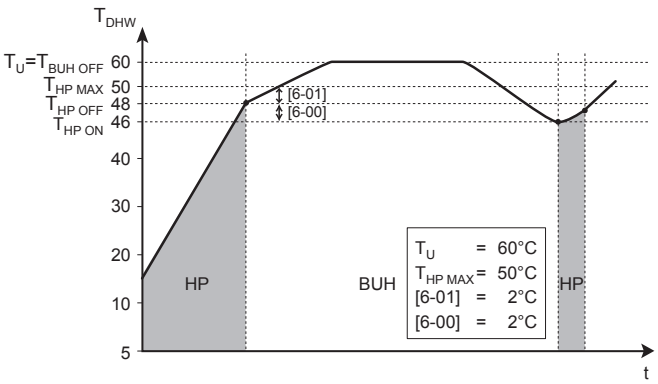
#	Code	Description
[A.4.7]	[0-0E] [0-0D] [0-0C] [0-0B]	Weather-dependent curve  ▪ T_{DHW}: The desired tank temperature. ▪ T_a: The (averaged) outdoor ambient temperature ▪ [0-0E]: low outdoor ambient temperature. −20~5°C (default: −20°C) ▪ [0-0D]: high outdoor ambient temperature: 10~20°C (default: 15°C) ▪ [0-0C]: desired tank temperature when the outdoor temperature equals or drops below the low ambient temperature: 55~60°C (default: 60°C) ▪ [0-0B]: desired tank temperature when the outdoor temperature equals or rises above the high ambient temperature: 35~55°C (default: 45°C)

Limits on heat pump operation

In domestic hot water operation, following hysteresis values can be set for the heat pump operation:

#	Code	Description
N/A	[6-00]	The temperature difference determining the heat pump ON temperature. Range: 2~20°C (default: 2)
N/A	[6-01]	The temperature difference determining the heat pump OFF temperature. Range: 0~10°C (default: 2)

Example:

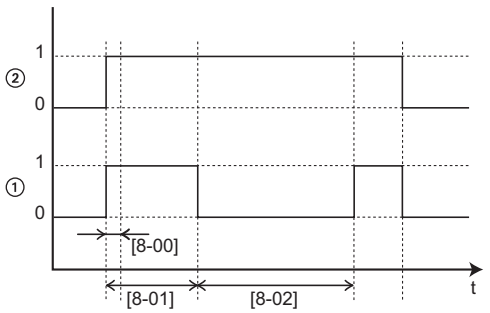


BUH Backup heater
HP Heat pump. If heating up time by the heat pump takes too long, auxiliary heating by the backup heater can take place
$T_{BUH\ OFF}$ Backup heater OFF temperature (T_U)
$T_{HP\ MAX}$ Maximum heat pump temperature at sensor in domestic hot water tank
$T_{HP\ OFF}$ Heat pump OFF temperature ($T_{HP\ MAX}$−[6-01])
$T_{HP\ ON}$ Heat pump ON temperature ($T_{HP\ OFF}$−[6-00])
T_{DHW} Domestic hot water temperature
T_U User set point temperature (as set on the user interface)
t Time

Timers for simultaneous request space and domestic hot water operation

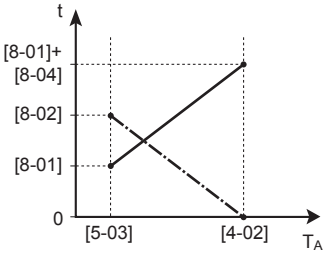
#	Code	Description
N/A	[8-00]	Minimum running time for domestic hot water operation. During this time, space heating is NOT allowed, even when the target domestic hot water temperature has been reached. Range: 0~20 minutes (default: 5)
N/A	[8-01]	Maximum running time for domestic hot water operation. Domestic hot water heating stops even when the target domestic hot water temperature is NOT reached. The actual maximum running time also depends on setting [8-04]. ▪ When system layout = Room thermostat control: This preset value is only taken into account if there is a request for space heating. If there is NO request for space heating, the tank is heated until the setpoint has been reached. ▪ When system layout ≠ Room thermostat control: This preset value is always taken into account. Range: 5~95 minutes (default: 30)
N/A	[8-02]	Anti-recycling time. Minimum time between two cycles for domestic hot water. The actual anti-recycling time also depends on ambient temperature. Range: 0~10 hours (default: 0.5) (step: 1/2 hour)
N/A	[8-04]	Additional running time for the maximum running time depending on the outdoor ambient limit temperature [4-02]. Range: 0~95 minutes (default: 95)

[8-02]: Anti-recycling time



1 Heat pump domestic water heating mode (1=active, 0=not active)
2 Hot water request for heat pump (1=request, 0=no request)
t Time

[8-04]: Additional running time at [4-02]



T_A Ambient (outdoor) temperature
t Time
Anti-recycle time space operation
Maximum running time domestic hot water

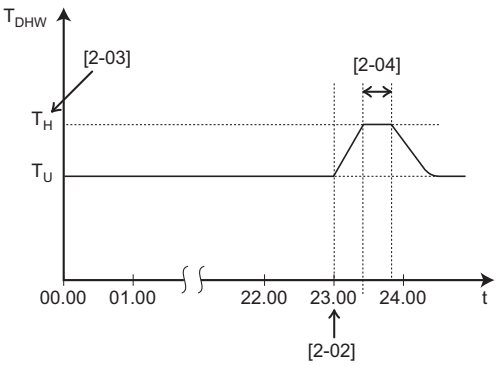
Disinfection

The disinfection function disinfects the domestic hot water tank by periodically heating the domestic hot water to a specific temperature.

CAUTION

The disinfection function settings MUST be configured by the installer according to the applicable legislation.

#	Code	Description
[A.4.4.2]	[2-00]	Operation day: ▪ 0: Each day ▪ 1: Monday ▪ 2: Tuesday ▪ 3: Wednesday ▪ 4: Thursday ▪ 5 (default): Friday ▪ 6: Saturday ▪ 7: Sunday
[A.4.4.1]	[2-01]	Disinfection ▪ 0: No ▪ 1 (default): Yes
[A.4.4.3]	[2-02]	Start time: 00~23:00 (default: 23:00), step: 1:00.
[A.4.4.4]	[2-03]	Temperature target: 60°C (fixed).
[A.4.4.5]	[2-04]	Duration: 40~60 minutes, default: 60 minutes.



T_{DHW} Domestic hot water temperature
T_U User set point temperature
T_H High set point temperature [2-03]
t Time

WARNING

Be aware that the domestic hot water temperature at the hot water tap will be equal to the value selected in field setting [2-03] after a disinfection operation.

When the high domestic hot water temperature can be a potential risk for human injuries, a mixing valve (field supply) shall be installed at the hot water outlet connection of the domestic hot water tank. This mixing valve shall secure that the hot water temperature at the hot water tap never rise above a set maximum value. This maximum allowable hot water temperature shall be selected according to the applicable legislation.

CAUTION

Be sure that the disinfection function start time [A.4.4.3] with defined duration [A.4.4.5] is NOT interrupted by possible domestic hot water demand.

INFORMATION

In case of error code AH and no interruption of the disinfection function occurred due to domestic hot water tapping, following actions are recommended:

- When the Domestic hot water > Type > Reheat or Reheat + sched. is selected, it is recommended to program the start-up of the disinfection function at least 4 hours later than the last expected large hot water tapping. This start-up can be set by installer settings (disinfection function).
- When the Domestic hot water > Type > Scheduled only is selected, it is recommended to program a Storage eco 3 hours before the scheduled start-up of the disinfection function to preheat the tank.

INFORMATION

Disinfection function is restarted in case the domestic hot water temperature drops 5°C below the disinfection target temperature within the duration time.

INFORMATION

An AH error occurs if you do the following during disinfection:

- Set the user permission level to Installer.
- Go to the DHW tank temperature home page (Tank).
- Press ⏻ to interrupt the disinfection.

8.3.3 Heat source settings

Backup heater

Backup heater operation mode: defines when backup heater operation is disabled, enabled or only allowed during domestic hot water operation. This setting is only overruled when backup heating is required during malfunctioning of the heat pump (when [A.5.1.2] is set on manual or automatic).

#	Code	Description
[A.5.1.1]	[4-00]	Backup heater operation: ▪ 0: Limit ▪ 1 (default): Enable ▪ 2: Only domestic hot water operation.
[A.5.1.3]	[4-07]	Defines whether backup heater second step is: ▪ 1 (default): Allowed ▪ 0: NOT allowed In this way it is possible to limit the backup heater capacity.
N/A	[5-00]	Is backup heater operation allowed above equilibrium temperature during space heating operation? ▪ 1 (default): NOT allowed ▪ 0: Allowed
[A.5.1.4]	[5-01]	Equilibrium temperature. Outdoor temperature below which operation of the backup heater is allowed. Range: –15~35°C (default: 0°C) (step: 1°C)

INFORMATION

If the storage temperature set point is higher than 55°C, Daikin recommends NOT to disable the backup heater second step because it will have a big impact on the required time for the unit to heat up the domestic hot water tank.

Auto emergency

When the heat pump fails to operate the backup heater can serve as an emergency heater and either automatically or non-automatically take over the heat load. When auto emergency is activated and a heat pump failure occurs, the backup heater will automatically take over the heat load. When a heat pump failure occurs and auto emergency is not activated, the domestic hot water and space heating operations will stop and need to be recovered manually. The user interface will then ask you to confirm whether the backup heater can take over the heat load or not. When the heat pump fails, ⓘ will appear on the user interface. If the house is unattended for longer periods, we recommend that setting [A.5.1.2] Auto emergency operation shall be set to Automatic.

#	Code	Description
[A.5.1.2]	N/A	Defines whether in an emergency situation the backup heater is allowed to automatically take over the entire heat load or whether manual confirmation is required. ▪ 0: Manual (default) ▪ 1: Automatic

Bivalent

Applies only to installations with an auxiliary boiler (alternating operation, parallel connected). The purpose of this function is to determine — based on the outdoor temperature — which heating source can/will provide the space heating, either the indoor unit or an auxiliary boiler.

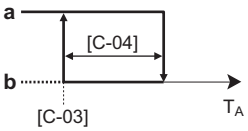
The field setting "bivalent operation" apply only the indoor unit space heating operation and the permission signal for the auxiliary boiler.

When the "bivalent operation" function is enabled, the indoor unit will stop automatically in space heating operation when the outdoor temperature drops below "bivalent ON temperature" and the permission signal for the auxiliary boiler becomes active.

When the bivalent operation function is disabled, the space heating by indoor unit is possible at all outdoor temperatures (see operation ranges) and permission signal for auxiliary boiler is ALWAYS deactivated.

- [C-03] Bivalent ON temperature: defines the outdoor temperature below which the permission signal for the auxiliary boiler will be active (closed, KCR on EKRP1HB) and space heating by indoor unit will be stopped.
- [C-04] Bivalent hysteresis: defines the temperature difference between bivalent ON temperature and bivalent OFF temperature.

Permission signal X1–X2 (EKRP1HB**)**



T_A Outdoor temperature
a Closed
b Open

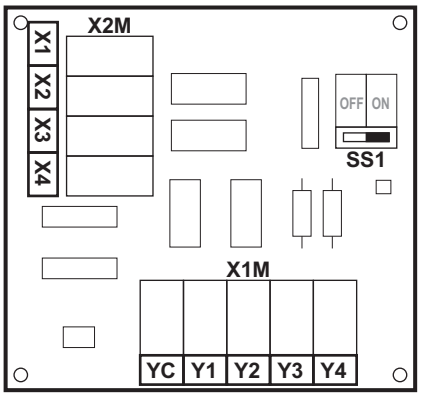
CAUTION

Make sure to observe all rules mentioned in application guideline 5 when bivalent operation function is enabled.

Daikin shall NOT be held liable for any damage resulting from failure to observe this rule.

INFORMATION

- The bivalent operation function has no impact on the domestic water heating mode. The domestic hot water is still and only heated by the indoor unit.
- The permission signal for the auxiliary boiler is located on the EKRP1HB (digital I/O PCB). When it is activated, the contact X1, X2 is closed and open when it is deactivated. See illustration below for the schematic location of this contact.



#	Code	Description
N/A	[C-03]	ON temperature. If the outdoor temperature drops below this temperature, the bivalent heat source permission signal will be active. –25~+25°C (default: 0°C)
N/A	[C 04]	Hysteresis. Temperature difference between bivalent heat source ON and OFF to prevent too much switching. 2~10°C (default: 3°C)

8.3.4 System settings

Priorities

#	Code	Description
N/A	[5-02]	Space heating priority. 0 (default): This setting CANNOT be changed.
N/A	[5-03]	Space heating priority temperature. This setting is NOT applicable.
N/A	[C-01]	If there is a simultaneous demand for space heating and domestic hot water heating (by heat pump), which operation mode has priority? ▪ 0 (default): The operation mode with the highest request has priority. ▪ 1: Always space heating has priority.

Auto-restart

When power returns after a power supply failure, the auto restart function reapplies the remote controller settings at the time of the power failure. Therefore, Daikin recommends to always enable the function.

If the preferential kWh rate power supply is of the type that power supply is interrupted, always enable the auto restart function. Continuous indoor unit control can be guaranteed independent of the preferential kWh rate power supply status, by connecting the indoor unit to a normal kWh rate power supply.

#	Code	Description
[A.6.1]	[3-00]	Is the auto restart function of the unit allowed? ▪ 0: No ▪ 1 (default): Yes

Preferential kWh rate power supply

#	Code	Description
[A.2.1.6]	[D-01]	Connection to a preferential kWh rate power supply: ▪ 0 (default): The heat pump module is connected to a normal power supply. ▪ 1: The heat pump module is connected to a preferential kWh rate power supply. When the preferential kWh rate signal is sent by the electricity company, the contact will open and the unit will go in forced off mode. When the signal is released again, the voltage-free contact will close and the unit will restart operation. Therefore, always enable the auto restart function. ▪ 2: The heat pump module is connected to a preferential kWh rate power supply. When the preferential kWh rate signal is sent by the electricity company, the contact will close and the unit will go in forced off mode. When the signal is released again, the voltage-free contact will open and the unit will restart operation. Therefore, always enable the auto restart function.

#	Code	Description
[A.6.2.1]	[D-00]	Which heaters are allowed to operate during preferential kWh rate power supply? ▪ 0 (default): None

NOTICE

The setting brine freezing temperature can be modified and the read out is correct in [A.6.9] Brine freezeup temp ONLY after having accessed menu [A.8] Overview settings.

This setting can ONLY be modified and/or saved and the read out is ONLY correct if the communication between hydro module and compressor module is present. The communication between hydro module and compressor module is NOT guaranteed and/or applicable if:

- error "U4" appears on the user interface,
- the heat pump module is connected to preferential kWh rate power supply where power supply is interrupted and preferential kWh rate power supply is activated.

[D-00]	Backup heater	Compressor
0 (default)	Forced OFF	Forced OFF

Power consumption control

NOTICE

During periods of excessive capacity demand (example: screed dryout function), the power limitation can be activated in accordance to the dimension of the brine earth collector.

See "5 Application guidelines" on page 8 for detailed information about this functionality.

Pwr consumpt. control

#	Code	Description
N/A	[4-08]	Mode: ▪ 0 (No limitation)(default): Disabled. ▪ 1 (Continuous): Enabled: You can set one power limitation value (in A or kW) to which the system power consumption will be limited for all the time. ▪ 2 (Digital inputs): Enabled: You can set up to four different power limitation values (in A or kW) to which the system power consumption will be limited when the corresponding digital input asks.
N/A	[4-09]	Type: ▪ 0 (Current) (default): The limitation values are set in A. ▪ 1 (Power): The limitation values are set in kW.
N/A	[5-05]	Value: Only applicable in case of full time power limitation mode. 0~50 A, step 1 A (default: 50 A)
N/A	[5-09]	Value: Only applicable in case of full time power limitation mode. 0~20 kW, step 0.5 kW (default: 20 kW)
Amp. limits for DI: Only applicable in case of power limitation mode based on digital inputs and based on current values.		
N/A	[5-05]	Limit DI1 0~50 A, step 1 A (default: 50 A)
N/A	[5-06]	Limit DI2 0~50 A, step 1 A (default: 50 A)
N/A	[5-07]	Limit DI3 0~50 A, step 1 A (default: 50 A)
N/A	[5-08]	Limit DI4 0~50 A, step 1 A (default: 50 A)
kW limits for DI: Only applicable in case of power limitation mode based on digital inputs and based on power values.		
N/A	[5-09]	Limit DI1 0~20 kW, step 0.5 kW (default: 20 kW)
N/A	[5-0A]	Limit DI2 0~20 kW, step 0.5 kW (default: 20 kW)
N/A	[5-0B]	Limit DI3 0~20 kW, step 0.5 kW (default: 20 kW)
N/A	[5-0C]	Limit DI4 0~20 kW, step 0.5 kW (default: 20 kW)

Average timer

The average timer corrects the influence of ambient temperature variations. The weather-dependent set point calculation is done on the average outdoor temperature.

The outdoor temperature is averaged over the selected time period.

#	Code	Description
[A.6.4]	[1-0A]	Outdoor average timer: ▪ No averaging (default) ▪ 12 hours ▪ 24 hours ▪ 48 hours ▪ 72 hours

Pump operation

The pump operation field setting apply to the pump operation logic only when [F-0D]=1.

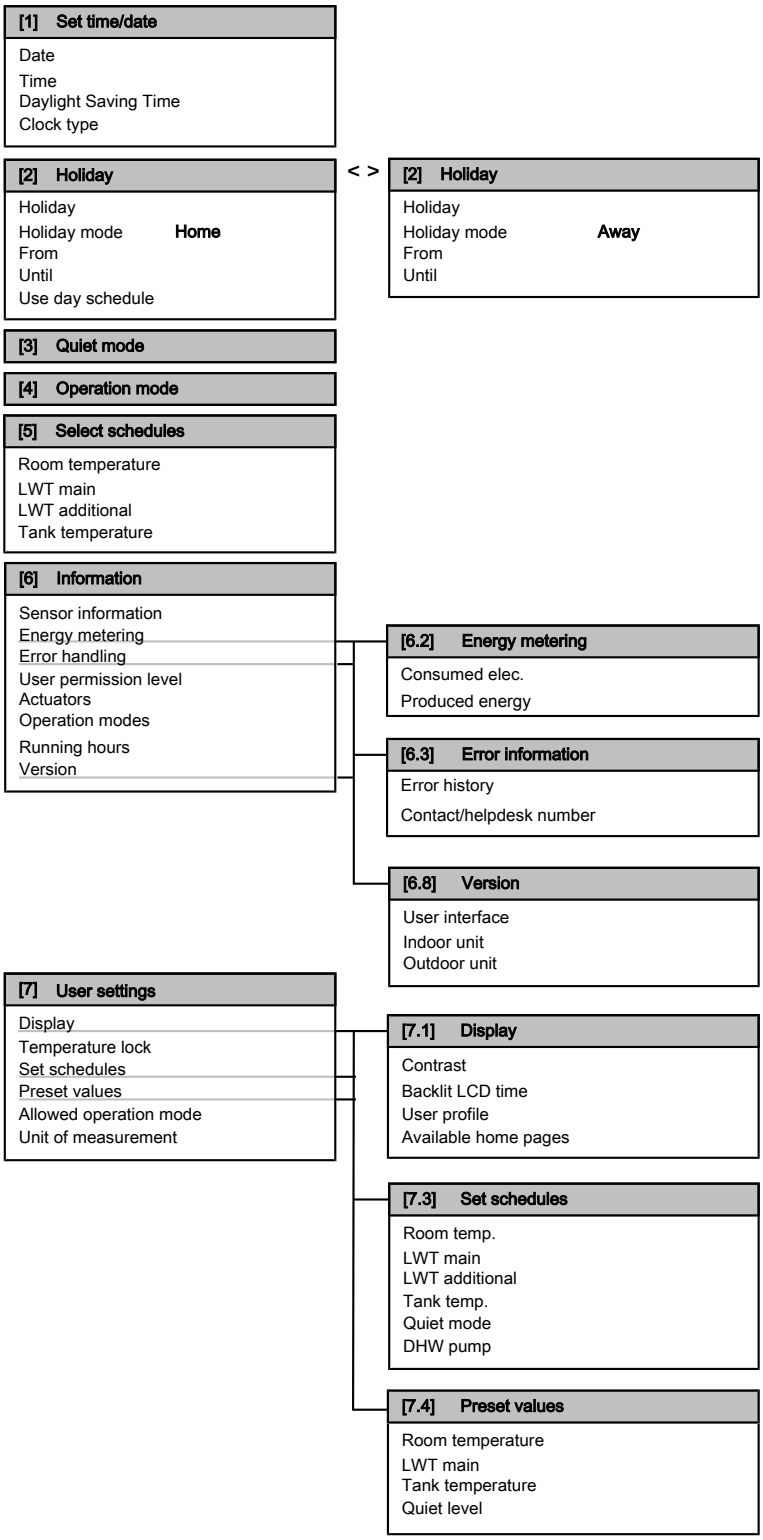
When the pump operation function is disabled the pump will stop if the outdoor temperature is higher than the value set by [4-02]. When the pump operation is enabled, the pump operation is possible at all outdoor temperatures.

#	Code	Description
N/A	[F-00]	Pump operation: ▪ 0 (default): Disabled if outdoor temperature is higher than [4-02]. ▪ 1: Possible at all outdoor temperatures.

Pump operation during flow abnormality [F-09] defines whether the pump stops at flow abnormality or allow to continue operation when flow abnormality occurs. This functionality is only valid in specific conditions where it is preferable to keep the pump active when T_a <4°C (pump will be activated for 10 minutes and deactivated after 10 minutes). Daikin shall NOT be held liable for any damage resulting this functionality.

#	Code	Description
N/A	[F-09]	Pump continue operation when flow abnormality: ▪ 0: Pump will be deactivated. ▪ 1 (default): Pump will be activated when T_a<4°C (10 minutes ON – 10 minutes OFF)

8.4 Menu structure: Overview user settings



INFORMATION

Energy metering functionality is NOT applicable and/or NOT valid for this unit if it is calculated by the unit. If optional external meters are used, energy metering display is valid.

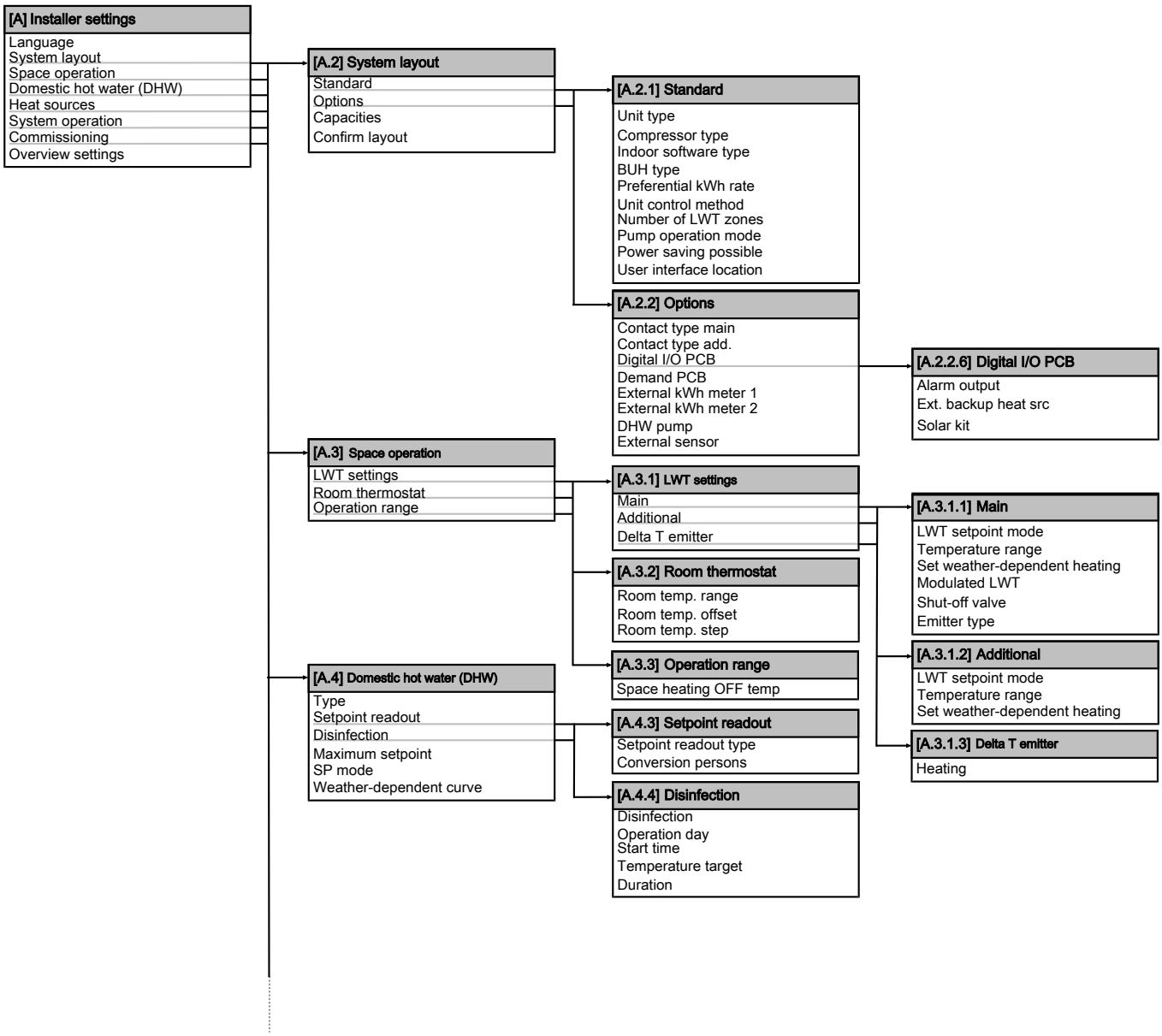
INFORMATION

Quiet mode and quiet level is NOT applicable for this unit.

INFORMATION

- Indoor unit relates to indoor unit PCB which controls the hydraulic part of the ground source heat pump.
- Outdoor unit relates to outdoor unit PCB which controls the compressor module of the ground source heat pump.

8.5 Menu structure: Overview installer settings



INFORMATION

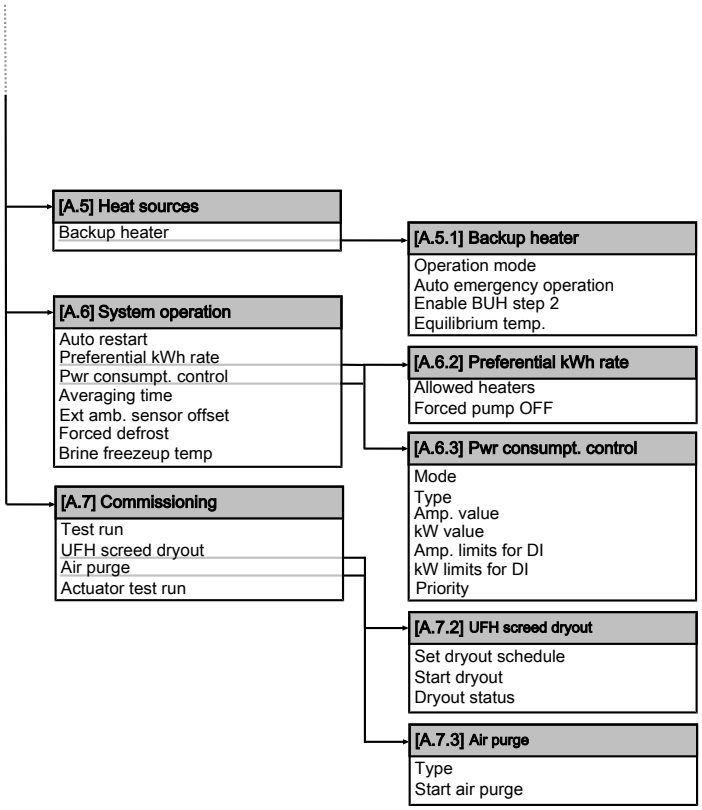
Forced defrost settings are shown but are NOT applicable for this unit. Settings shall NOT be used or changed.

INFORMATION

Solar kit settings are shown but are NOT applicable for this unit. Settings shall NOT be used or changed.

INFORMATION

Power saving settings are shown but are NOT applicable for this unit. Settings shall NOT be used or changed.


[A.5] Heat sources
Backup heater
[A.5.1] Backup heater
Operation mode
Auto emergency operation
Enable BUH step 2
Equilibrium temp.
[A.6] System operation
Auto restart
Preferential kWh rate
Pwr consumpt. control
Averaging time
Ext amb. sensor offset
Forced defrost
Brine freezeup temp
[A.6.2] Preferential kWh rate
Allowed heaters
Forced pump OFF
[A.6.3] Pwr consumpt. control
Mode
Type
Amp. value
kW value
Amp. limits for DI
kW limits for DI
Priority
[A.7] Commissioning
Test run
UFH screed dryout
Air purge
Actuator test run
[A.7.2] UFH screed dryout
Set dryout schedule
Start dryout
Dryout status
[A.7.3] Air purge
Type
Start air purge

9 Commissioning

INFORMATION

During the first running period of the unit, the required power may be higher than stated on the nameplate of the unit. This phenomenon is caused by the compressor, that needs a continuous run time of 50 hours before reaching smooth operation and stable power consumption.

9.1 Overview: Commissioning

This chapter describes what you have to do and know to commission the system after it is configured.

Typical workflow

Commissioning typically consists of the following stages:

1 Checking the "Checklist before test run".
2 Performing an air purge.
3 Performing a test run for the system.
4 If necessary, performing a test run for one or more actuators.
5 If necessary, performing an underfloor heating screed dryout.

9.2 Checklist before test run

Do NOT operate the system before the following checks are OK:

☐	The **indoor unit** is properly mounted.
☐	The following **field wiring** has been carried out according to this document and the applicable legislation: ▪ Between the local supply panel and the indoor unit ▪ Between the indoor unit and the valves (if applicable) ▪ Between the indoor unit and the room thermostat (if applicable)
☐	The system is properly **earthed** and the earth terminals are tightened.
☐	The **fuses** or locally installed protection devices are installed according to this document, and have not been bypassed.
☐	The **power supply voltage** matches the voltage on the identification label of the unit.
☐	There are NO **loose connections** or damaged electrical components in the switch box.
☐	There are NO **damaged components** or **squeezed pipes** on the inside of the indoor unit.
☐	There are NO **refrigerant leaks**.
☐	The correct pipe size is installed and the **pipes** are properly insulated.
☐	There is NO **water and/or brine leak** inside the indoor unit.
☐	There are no **odour traces** noticeable of the used brine.
☐	The **space heating air purge** valve is open (at least 2 turns).
☐	The **pressure relief valves** purge to a safe location when opened.

NOTICE

NEVER operate the unit without thermistors and/or pressure sensors/switches, burning of the compressor may result.

9.3 Air purge function on the space heating circuit

INFORMATION

For air purging the brine circuit, refer to the instructions of the field supplied brine filling equipment.

When commissioning and installing the unit, it is very important to remove all air in the water circuit. When the air purge function is running, the pump operates without actual operation of the unit and the remove of air in the water circuit will start.

There are 2 modes to purge air:

- Manually: the unit will operate with a fixed pump speed and in a fixed or custom position of the 3-way valve. The custom position of the 3-way valve is a helpful feature to remove all air from the water circuit in space heating or domestic hot water heating mode. The operation speed of the pump (slow or quick) can also be set.
- Automatic: the unit change automatically the pump speed and the position of the 3-way valve between space heating or domestic hot water heating mode.

Make sure the user interface shows the home screens and that the space heating and domestic hot water demands are turned off.

The air purge function stops automatically after 30 minutes.

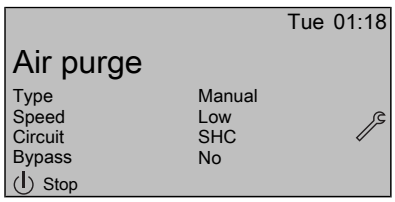
INFORMATION

It is recommended to start the air purge function in manual mode. When almost all of the air is removed, it is recommended to start the automatic mode. If necessary, repeat the automatic mode until you are sure that all air is removed from the system.

9.3.1 To perform a manual air purge

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 36.
2 Set the air purge mode: go to [A.7.3.1] > Installer settings > Commissioning > Air purge > Type.
3 Select Manual and press OK.
4 Go to [A.7.3.4] > Installer settings > Commissioning > Air purge > Start air purge and press OK to start the air purge function.

Result: The manual air purge starts and the following screen appears.



5 Use the ◀ and ▶ buttons to scroll to Speed.
6 Use the ▲ and ▼ buttons to set the desired pump speed.

Result: Low

Result: High

7 If applicable, set the desired position of the 3-way valve. Use the ◀ and ▶ buttons to scroll to Circuit.
8 Use the ▲ and ▼ buttons to set the desired position of the 3-way valve.

Result: SHC

Result: Tank

9 Set the desired position of the bypass valve. Use the ◀ and ▶ buttons to scroll to Bypass.

10 Use the ▲ and ▼ buttons to set the desired position of the bypass valve.

Result: No (boiler not bypassed)

Result: Yes (boiler bypassed)

Result: The air purge function automatically stops after 42 minutes.

9.3.2 To perform an automatic air purge

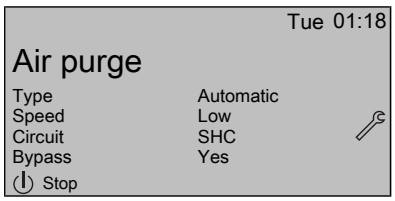
1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 36.

2 Set the air purge mode: go to [A.7.3.1] > Installer settings > Commissioning > Air purge > Type.

3 Select Automatic and press OK.

4 Go to [A.7.3.4] > Installer settings > Commissioning > Air purge > Start air purge and press OK to start the air purge function.

Result: Air purging will start and the following screen will be shown.



Result: The air purge function automatically stops after 42 minutes.

9.3.3 To interrupt air purge

1 Press and press OK to confirm the interruption of the air purge function.

9.4 To perform a test run

Prerequisite: Make sure the user interface shows the home screens and that the space heating and domestic hot water demands are turned off.

1 Go to [A.7.1]: > Installer settings > Commissioning > Test run.

2 Select a test and press OK. **Example:** Heating.

3 Select OK and press OK.

Result: The test run starts. It stops automatically when done (±30 min). To stop it manually, press , select OK and press OK.

INFORMATION

If 2 user interfaces are present, you can start a test run from both user interfaces.

- The user interface used to start the test run displays a status screen.
- The other user interface displays a "busy" screen. You cannot stop the test run as long as the "busy" screen is shown.

If the installation of the unit has been done correctly, the unit will start up during test operation in the selected operation mode. During the test mode, the correct operation of the unit can be checked by monitoring leaving water temperature (heating mode) and tank temperature (domestic hot water mode).

To monitor the temperature, go to [A.6] and select the information you want to check.

9.5 To perform an actuator test run

Purpose of the actuator test run is to confirm the operation of the different actuators (e.g., when you select pump operation, a test run of the pump will start).

Prerequisite: Make sure the user interface shows the home screens and that the space heating and domestic hot water demands are turned off.

1 Make sure the room temperature control, the leaving water temperature control and the domestic hot water control are turned OFF via the user interface.

2 Go to [A.7.4]: > Installer settings > Commissioning > Actuator test run.

3 Select an actuator and press OK. **Example:** Pump.

4 Select OK and press OK.

Result: The actuator test run starts. It automatically stops when finished. To stop it manually, press , select OK and press OK.

9.5.1 Possible actuator test runs

- Backup heater (step 1) test
- Backup heater (step 2) test
- Pump test (space heating)

INFORMATION

Calibration of the produced heat calculation is included in this test.

Make sure that air is purged before executing the test run. Also avoid causing disturbances in the water circuit during the test run.

- Brine pump test
- 2-way valve test
- 3-way valve test
- Bivalent signal test
- Alarm output test
- Circulation pump test

9.6 Underfloor heating screed dryout

This function will be used to dry-out the screed of an underfloor heating very slowly during the construction of a house. It allows the installer to program and execute this program.

NOTICE

The installer is responsible for:

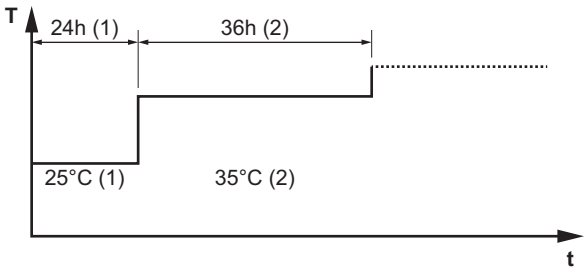
- contacting the screed manufacturer for the initial heating instructions to avoid cracking the screed,
- programming the underfloor heating screed dryout schedule according to the above instruction of the screed manufacturer,
- checking the proper functioning of the setup on a regular basis,
- selecting the correct program complying with the type of the used screed of the floor.

The installer can program up to 20 steps where for each step he needs to enter:

1 the duration by a number of hours up to 72 hours,

2 the desired leaving water temperature.

Example:



T Desired leaving water temperature (15~55°C)
t Duration (1~72h)
(1) Action step 1
(2) Action step 2

9.6.1 To program an underfloor heating screed dryout schedule

1 Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout > Set dryout schedule.
2 Use the , , , and to program the schedule.
   - Use and to scroll through the schedule.
   - Use and to adjust the selection.
     If a time is selected, you can set the duration between 1 and 72 hours.
     If a temperature is selected, you can set the desired leaving water temperature between 15°C and 55°C.
3 To add a new step, select "–h" or "–" on an empty line and press .
4 To delete a step, set the duration to "–" by pressing .
5 Press OK to save the schedule.

INFORMATION

It is important that there is no empty step in the program. The schedule will stop when a blank step is programmed OR when 20 consecutive steps have been executed.

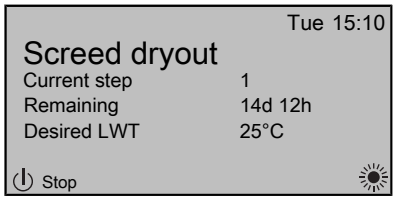
9.6.2 To perform an underfloor heating screed dryout

INFORMATION

Preferential kWh rate power supply cannot be used in combination with underfloor heating screed dryout.

1 Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout.
2 Set a dryout program.
3 Select Start dryout and press OK.
4 Select OK and press OK.

Result: The underfloor heating screed dryout starts and following screen will be shown. It stops automatically when done. To stop it manually, press , select OK and press OK.



9.6.3 To readout the status of an underfloor heating screed dryout

1 Press .
2 The current step of the program, the total remaining time, and the current desired leaving water temperature will be displayed.

INFORMATION

There is limited access to the menu structure. Only the following menus can be accessed:

- Information.
- Installer settings > Commissioning > UFH screed dryout

9.6.4 To interrupt an underfloor heating screed dryout

When the program is stopped by an error, an operation switch off, or a power failure, the U3 error will be displayed on the user interface. To resolve the error codes, see "12.4 Solving problems based on error codes" on page 64. To reset the U3 error, your User permission level needs to be Installer.

1 Go to the underfloor heating screed dryout screen.
2 Press .
3 Press to interrupt the program.
4 Select OK and press OK.

Result: The underfloor heating screed dryout program is stopped.

When the program is stopped due to an error, an operation switch-off, or a power failure, you can read out the underfloor heating screed dryout status.

5 Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout > Dryout status > Stopped at and followed by the last executed step.
6 Modify and restart the execution of the program.

10 Hand-over to the user

Once the test run is finished and the unit operates properly, please make sure the following is clear for the user:

- Fill in the installer setting table (in the operation manual) with the actual settings.
- Make sure that the user has the printed documentation and ask him/her to keep it for future reference. Inform the user that he can find the complete documentation on the url as earlier described in this manual.
- Explain the user how to properly operate the system and what he/she has to do in case of problems.
- Show the user what he/she has to do in relation to maintaining the unit.
- Explain the user about energy saving tips as described in the operation manual.

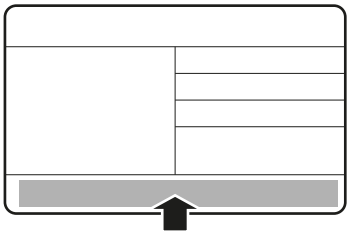
10.1 To fix the applicable language on the unit name plate

NOTICE

National implementation of EU regulation on certain fluorinated greenhouse gases may require to provide the appropriate official language on the unit. Therefore, an additional multilingual fluorinated greenhouse gases label is supplied with the unit.

1 From the multilingual fluorinated greenhouse gases label peal off the applicable language.

2 Stick it on top of the marked area on the unit name plate.



11 Maintenance and service

NOTICE

Maintenance should preferably be carried out yearly by an installer or service agent.

11.1 Overview: Maintenance and service

This chapter contains information about:

- The yearly maintenance of the indoor unit

11.2 Maintenance safety precautions

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING

NOTICE: Risk of electrostatic discharge

Before performing any maintenance or service work, touch a metal part of the unit in order to eliminate static electricity and to protect the PCB.

11.3 Checklist for yearly maintenance of the indoor unit

Check the following at least once a year:

- Fluid pressure of space heating and brine circuit
- Filters
- Pressure relief valves (1 at brine side, 1 at space heating side)
- Relief valve hoses
- Pressure relief valve of the domestic hot water tank
- Switch box
- Descaling
- Chemical disinfection
- Anode
- Brine leakage

Fluid pressure

Check whether the fluid pressure is above 1 bar. If it is lower, add fluid.

Filters

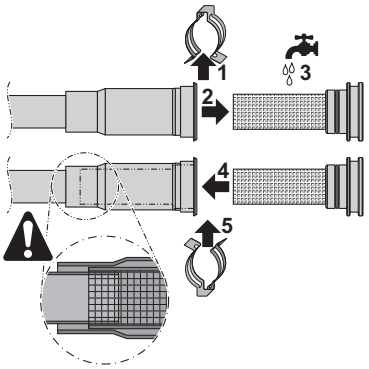
Clean the filters.

NOTICE

Handle the space heating circuit filter with care. Do NOT use excessive force when you reinsert the water filter so as NOT to damage the water filter mesh.

NOTICE

When removing the filter circlip, do NOT drop it.



Pressure relief valve

Open the valve and check the correct operation. **Discharge may be very hot!**

Checkpoints are:

- Fluid flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.
- Fluid coming out from the relief valve and contains debris or dirt:
  - open the valve until the discharged water does NOT contain dirt anymore
  - flush the system and install an additional water filter (a magnetic cyclone filter is preferably).

It is recommended to do this maintenance more frequently.

Pressure relief valve hose

Check whether the pressure relief valve hose is positioned appropriately to drain. See "7.5.3 To connect the pressure relief valve to the drain" on page 29 and "7.4.4 To connect the pressure relief valve to the drain on the brine side" on page 27.

Relief valve of the domestic hot water tank (field supply)

Open the valve and check the correct operation. **Water may be very hot!**

Checkpoints are:

- The water flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.
- Dirty water coming out of the relief valve:
  - open the valve until the discharged water does not contain dirt anymore
  - flush and clean the complete tank, including the piping between the relief valve and cold water inlet.

To make sure this water originates from the tank, check after a tank heat up cycle.

It is recommended to do this maintenance more frequently.

Switch box

- Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring.
- Using an ohmmeter, check if contactors K1M, K2M, K3M and K5M (depending on your installation) operate correctly. All contacts of these contactors must be in open position when the power is turned OFF.

WARNING

If the internal wiring is damaged, it has to be replaced by the manufacturer, its service agent or similarly qualified persons.

Descaling

Depending on water quality and set temperature, scale can deposit on the heat exchanger inside the domestic hot water tank and can restrict heat transfer. For this reason, descaling of the heat exchanger may be required at certain intervals.

Chemical disinfection

If the applicable legislation requires a chemical disinfection in specific situations, involving the domestic hot water tank, please be aware that the domestic hot water tank is a stainless steel cylinder containing an aluminium anode. We recommend to use a non-chloride based disinfectant approved for use with water intended for human consumption.

NOTICE

When using means for descaling or chemical disinfection, it must be ensured that the water quality remains compliant with EU directive 98/83 EC.

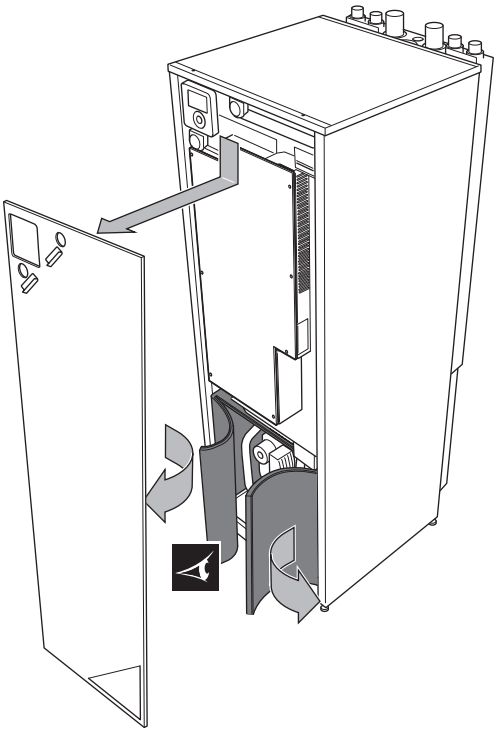
Anode

No maintenance or replacement required.

Brine leakage

Carefully check if brine leakage is noticeable around the inside of the unit.

Open the sound insulation jacket and check if brine leakage is noticeable inside this enclosed volume.

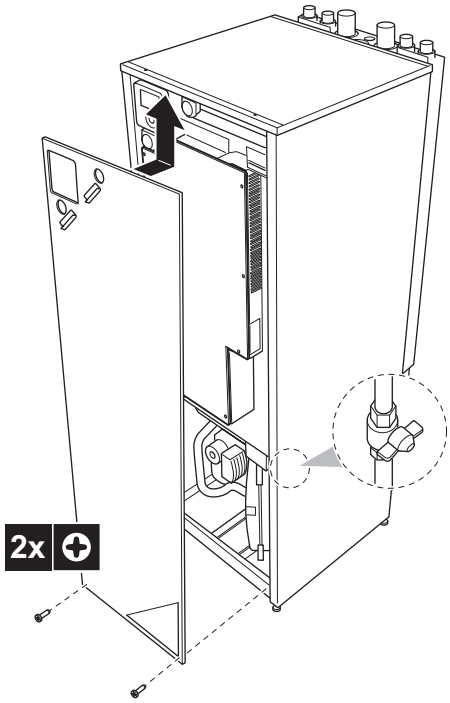


11.3.1 To drain the domestic hot water tank

1 Switch OFF the power supply.
2 Turn OFF the cold water supply.
3 Open the hot water taps.
4 Open the drain valve.

11.4 To drain the domestic hot water tank

1 Open the front panel.
2 The drain hose is located at the right side of the unit. Cut the tie wraps or tape and bring the flexible drain hose forward.



a Drain hose

INFORMATION

To drain the tank, all the hot water tapping points need to be opened to allow air to enter the system.

12 Troubleshooting

12.1 Overview: Troubleshooting

This chapter describes what you have to do in case of problems.

It contains information about:

- Solving problems based on symptoms
- Solving problems based on error codes

12.2 General guidelines

Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

WARNING

- When carrying out an inspection on the switch box of the unit, always make sure that the unit is disconnected from the mains. Turn off the respective circuit breaker.
- When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. NEVER bridge safety devices or change their values to a value other than the factory default setting. If you are unable to find the cause of the problem, call your dealer.

DANGER: RISK OF ELECTROCUTION

WARNING

Prevent hazard due to the inadvertent resetting of the thermal cut-out: this appliance must NOT be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly turned ON and OFF by the utility.

DANGER: RISK OF BURNING

12.3 Solving problems based on symptoms

12.3.1 Symptom: The unit is NOT heating as expected

Possible causes	Corrective action
The temperature setting is NOT correct	Check the temperature setting on the remote controller. Refer to the operation manual.
The water or brine flow is too low	Check and make sure that: ▪ All shut-off valves of the water or brine circuit are completely open. ▪ The water filter is clean. Clean if necessary. ▪ There is no air in the system. Purge air if necessary. You can purge air manually (see "9.3.1 To perform a manual air purge" on page 57) or use the automatic air purge function (see "9.3.2 To perform an automatic air purge" on page 58). ▪ The water pressure is >1 bar. ▪ The expansion vessel is NOT broken. ▪ The resistance in the water circuit is NOT too high for the pump. If the problem persists after you have conducted all of the above checks, contact your dealer. In some cases, it is normal that the unit decides to use a low water flow.
The water volume in the installation is too low	Make sure that the water volume in the installation is above the minimum required value (see "6.3.3 To check the water volume of the space heating circuit and brine circuit" on page 20).

12.3.2 Symptom: The compressor does NOT start (space heating or domestic water heating)

Possible causes	Corrective action
The unit must start up out of its operation range (the water temperature is too low)	If the water temperature is too low, the unit uses the backup heater to reach the minimum water temperature first (15°C). Check and make sure that: ▪ The power supply to the backup heater is correctly wired. ▪ The backup heater thermal protector is NOT activated. ▪ The backup heater contactors are NOT broken. If the problem persists after you have conducted all of the above checks, contact your dealer.
The preferential kWh rate power supply settings and electrical connections do NOT match	This should match with the connections as explained in "6.4 Preparing electrical wiring" on page 22 and "7.6.4 To connect the main power supply" on page 32.
The preferential kWh rate signal was sent by the electricity company	Wait for the power to return (2 hours max.).

12.3.3 Symptom: The pump is making noise (cavitation)

Possible causes	Corrective action
There is air in the system	Purge air manually (see "9.3.1 To perform a manual air purge" on page 57) or use the automatic air purge function (see "9.3.2 To perform an automatic air purge" on page 58).
The pressure at the pump inlet is too low	Check and make sure that: ▪ The pressure is >1 bar. ▪ The manometer is not broken. ▪ The expansion vessel is not broken. ▪ The pre-pressure setting of the expansion vessel is correct (see "6.3.4 Changing the pre-pressure of the expansion vessel" on page 21).

12.3.4 Symptom: The pressure relief valve opens

Possible causes	Corrective action
The expansion vessel is broken	Replace the expansion vessel.
The water or brine volume in the installation is too high	Make sure that the water or brine volume in the installation is below the maximum allowed value (see "6.3.3 To check the water volume of the space heating circuit and brine circuit" on page 20 and "6.3.4 Changing the pre-pressure of the expansion vessel" on page 21).
The water circuit head is too high	The water circuit head is the difference in height between the unit and the highest point of the water circuit. If the unit is located at the highest point of the installation, the installation height is considered 0 m. The maximum water circuit head is 10 m. Check the installation requirements.

12.3.5 Symptom: The pressure relief valve leaks

Possible causes	Corrective action
Dirt is blocking the water pressure relief valve outlet	Check whether the pressure relief valve works correctly by turning the red knob on the valve counterclockwise: ▪ If you do NOT hear a clacking sound, contact your dealer. ▪ If the water or brine keeps running out of the unit, close both inlet and outlet shut-off valves first and then contact your dealer.

12.3.6 Symptom: The space is NOT sufficiently heated at low outdoor temperatures

Possible causes	Corrective action
The backup heater operation is not activated	Check and make sure that: ▪ The backup heater operation mode is enabled. Go to: ▪ [A.5.1.1] > Installer settings > Heat sources > Backup heater > Operation mode OR ▪ [A.8] > Installer settings > Overview settings [4-00] ▪ The thermal protector of the backup heater has not been activated. If it has, check: ▪ The space heating and brine circuit pressure ▪ Whether there is air in the system ▪ The air purge operation Press the reset button in the switch box. See "14.3 Components" on page 69 for the location of the reset button.
The backup heater equilibrium temperature has not been configured correctly	Increase the “equilibrium temperature” to activate the backup heater operation at a higher outdoor temperature. Go to: ▪ [A.5.1.4] > Installer settings > Heat sources > Backup heater > Equilibrium temp. OR ▪ [A.8] > Installer settings > Overview settings [5-01]

12.3.7 Symptom: The pressure at the tapping point is temporarily unusual high

Possible causes	Corrective action
Failing or blocked pressure relief valve.	▪ Flush and clean the complete tank including the piping between pressure relief valve and the cold water inlet. ▪ Replace the pressure relief valve.

12.3.8 Symptom: Decoration panels are pushed away due to a swollen tank

Possible causes	Corrective action
Failing or blocked pressure relief valve.	Contact your local dealer.

12.3.9 Symptom: Tank disinfection function is NOT completed correctly (AH-error)

Possible causes	Corrective action
The disinfection function was interrupted by domestic hot water tapping	Program the start-up of the disinfection function when the coming 4 hours NO domestic hot water tapping is expected.
Large domestic hot water tapping happened recently before the programmed start-up of the disinfection function	When the Domestic hot water > Type > Reheat or Reheat + sched. is selected, it is recommended to program the start-up the disinfection function at least 4 hours later than the last expected large hot water tapping. This start-up can be set by installer settings (disinfection function). When the Domestic hot water > Type > Scheduled only is selected, it is recommended to program a Storage eco 3 hours before the scheduled start-up of the disinfection function to preheat the tank.

12.4 Solving problems based on error codes

When a problem happens, an error code appears on the user interface. It is important to understand the problem and to take countermeasure before resetting the error code. This should be done by a licensed installer or by your local dealer.

This chapter gives you an overview of all error codes and the content of the error code as it appears on the user interface.

For a more detailed troubleshooting guideline for each error, please see the service manual.

12.4.1 Error codes: Overview

Error codes of the unit

Error code	Detailed error code	Description
E1	00	OU: PCB defect. Power reset required. Please contact your dealer.
E3	00	OU: Actuation of high pressure switch (HPS). Please contact your dealer.
E5	00	OU: Overheat of inverter compressor motor. Please contact your dealer.
E7	00	Brine flow Abnormality Please contact your dealer.
H0	01	Brine flow switch malfunction Please contact your dealer.
H3	00	OU: Malfunction of high pressure switch (HPS) Please contact your dealer.
H9	00	OU: Malfunction of outdoor air thermistor. Please contact your dealer.
F3	00	OU: Malfunction of discharge pipe temperature. Please contact your dealer.
JA	00	OU: Malfunction of high pressure sensor. Please contact your dealer.
J3	00	OU: Malfunction of discharge pipe thermistor. Please contact your dealer.
J6	00	OU: Malfunction of heat exchanger thermistor. Please contact your dealer.
J7	12	Brine inlet thermistor abnormality Please contact your dealer.
J8	07	Brine outlet thermistor abnormality Please contact your dealer.
L3	00	OU: Electrical box temperature rise problem. Please contact your dealer.
L4	00	OU: Malfunction of inverter radiating fin temperature rise. Please contact your dealer.
L5	00	OU: Inverter instantaneous overcurrent (DC). Please contact your dealer.
P4	00	OU: Malfunction of radiating fin temperature sensor. Please contact your dealer.
U0	00	OU: Shortage of refrigerant. Please contact your dealer.
U2	00	OU: Defect of power supply voltage. Please contact your dealer.
U4	00	Indoor/outdoor unit communication problem.
UA	00	OU: Indoor/outdoor combination problem. Power reset required.
A1	00	Zero cross detection problem. Power reset required. Please contact your dealer.

Error code	Detailed error code	Description
AA	01	Backup heater overheated. Power reset required. Please contact your dealer.
UA	00	Indoor unit, outdoor unit matching problem. Power reset required.
7H	01	Water flow problem.
89	01	Heat exchanger frozen.
8H	00	Abnormal increase outlet water temperature.
8F	00	Abnormal increase outlet water temperature (DHW).
C0	00	Flow sensor/switch malfunction. Please contact your dealer.
U3	00	Under floor heating screed dryout function not completed correctly.
81	00	Leaving water temperature sensor problem. Please contact your dealer.
C4	00	Heat exchanger temperature sensor problem. Please contact your dealer.
80	00	Returning water temperature sensor problem. Please contact your dealer.
U5	00	User interface communication problem.
EC	00	Abnormal increase tank temperature.
HC	00	Tank temperature sensor problem. Please contact your dealer.
CJ	02	Room temperature sensor problem. Please contact your dealer.
H1	00	External temperature sensor problem. Please contact your dealer.
89	02	Heat exchanger frozen.
A1	00	EEPROM reading error.
AH	00	Tank disinfection function not completed correctly.
89	03	Heat exchanger frozen.

INFORMATION

- Indoor unit relates to indoor unit PCB which controls the hydraulic part of the ground source heat pump.
- Outdoor unit relates to outdoor unit PCB which controls the compressor module of the ground source heat pump.

13 Disposal

Dismantling of the unit, and treatment of the refrigerant, oil and other parts must comply with the applicable legislation.

14 Technical data

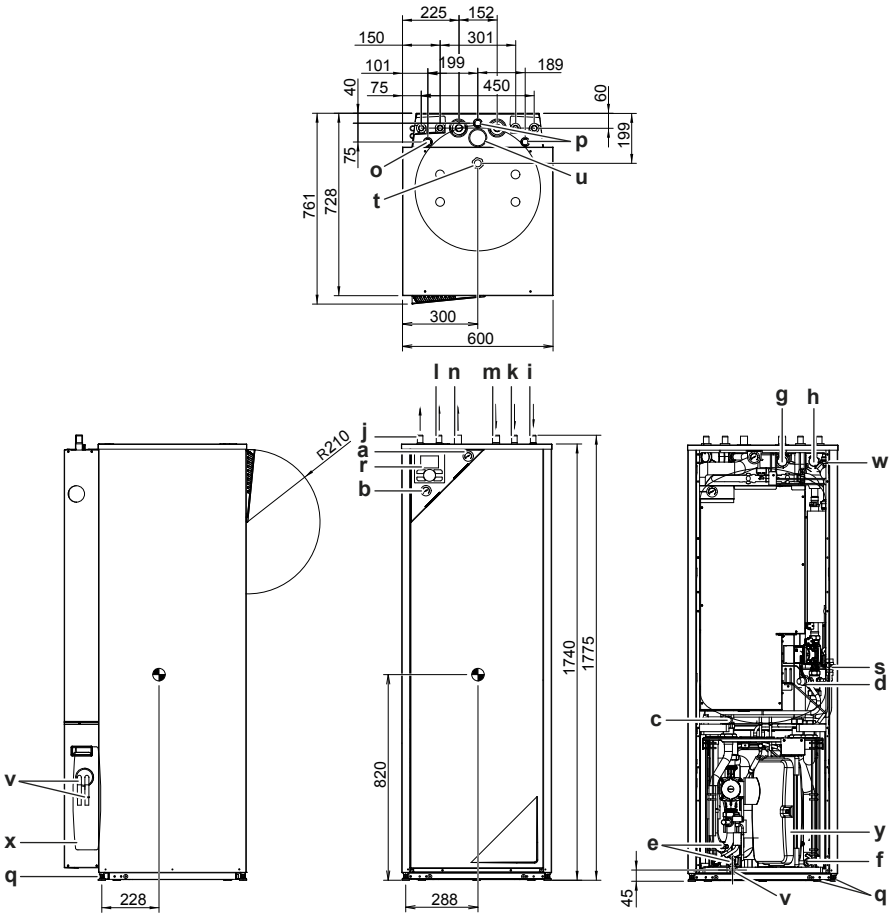
14.1 Overview: Technical data

This chapter contains information about:

- Dimensions and service space
- Components
- Piping diagram
- Wiring diagram
- Technical specifications
- Operation range
- ESP curve

14.2 Dimensions and service space

14.2.1 Dimensions and service space: Indoor unit

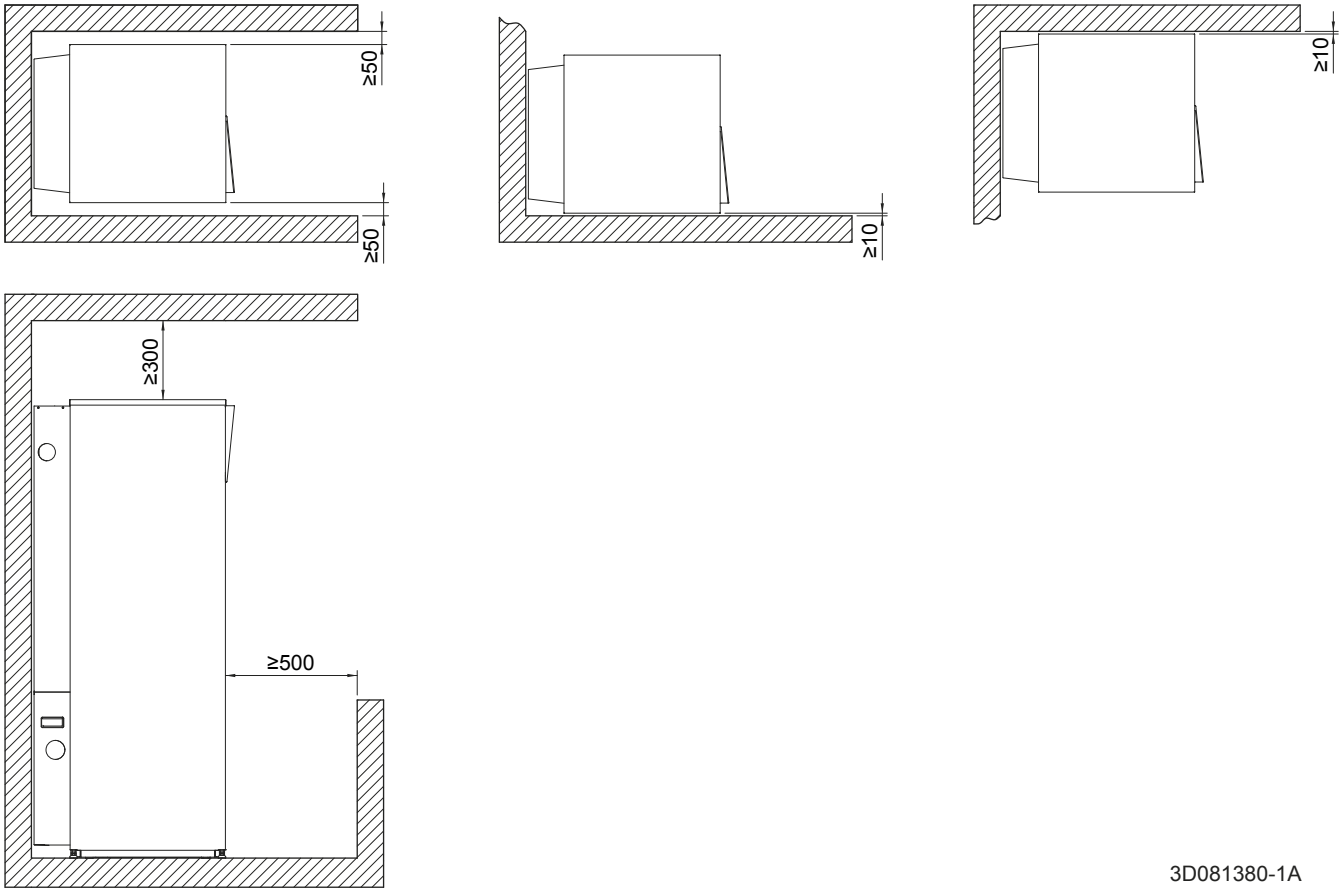


3D081375-1A

a Pressure gauge brine circuit
b Pressure gauge water circuit
c Safety valve brine circuit
d Safety valve water circuit
e Drain valve brine circuit
f Drain valve water circuit
g Water filter brine circuit
h Water filter water circuit
i Water IN connection 22 mm straight
j Water OUT connection 22 mm straight
k Tank IN connection 22 mm straight
l Tank OUT connection 22 mm straight
m Brine IN connection 28 mm straight
n Brine OUT connection 28 mm straight
o Control wiring intake (Ø24 mm)

p Power supply wiring intake (Ø24 mm)
q Leveling feet
r User interface (option EKRUCBL*)
s Drain valve tank circuit
t Recirculation connection G 1/2 female
u Hole for recirculation piping or option wiring (Ø62 mm)
v Drain outlet (unit+safety valve)
w Air purge
x Expansion vessel brine circuit
y Expansion vessel water circuit
Center of gravity. Note: Center of gravity with an empty tank.

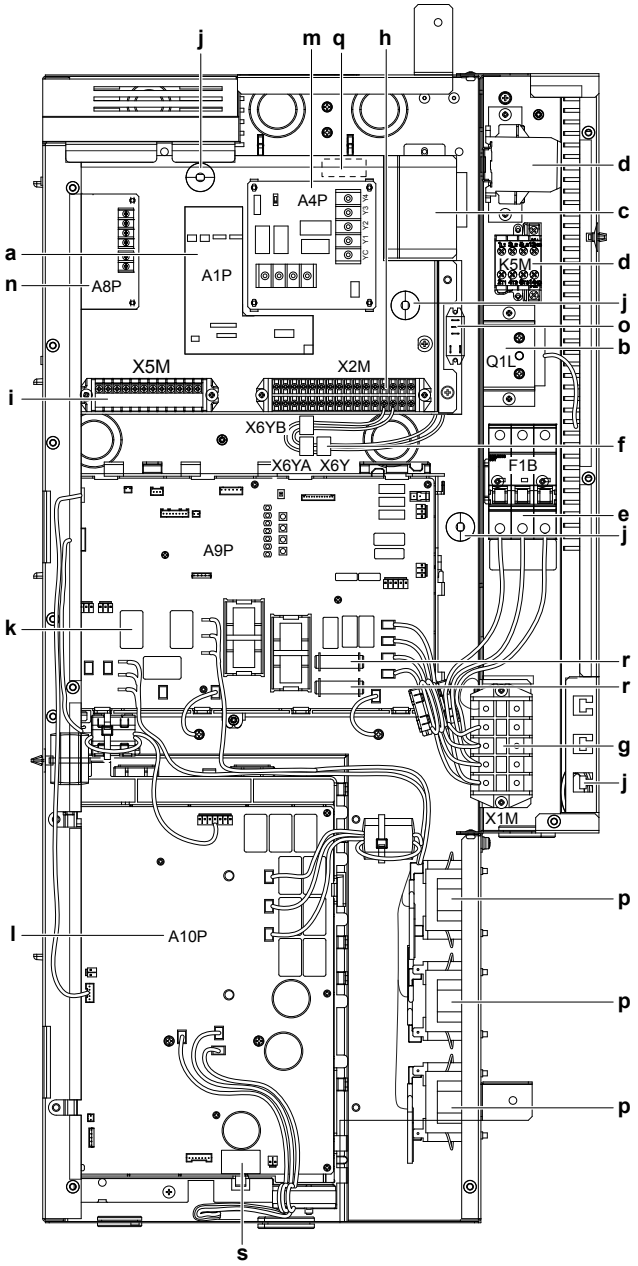
Note 1: Typical field installation is according to local and national regulations.
Note 2: A flexible hose is pre-assembled to the drain outlet. The exit of the flexible hose is at the backside of the unit. The flexible hose can be removed.



3D081380-1A

14.3 Components

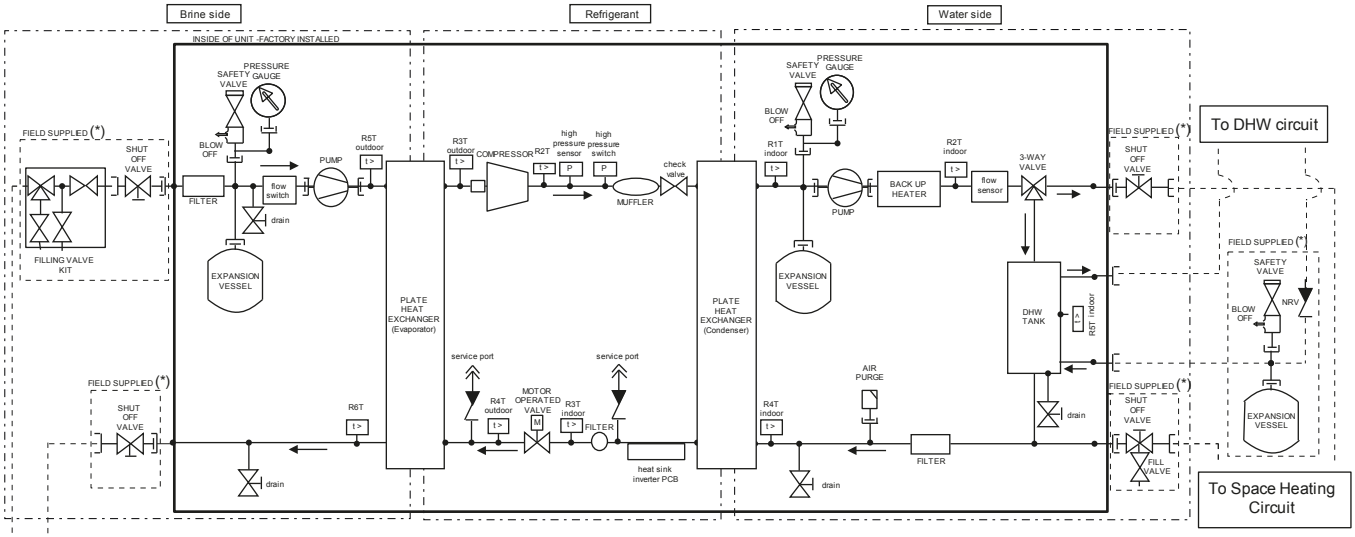
14.3.1 Components: Switch box (indoor unit)



a Main PCB (water) A1P
b Backup heater thermal protector Q1L
c Transformer TR1
d Backup heater contactors K1M, K2M and K5M
e Backup heater circuit breaker F1B
f Connectors X6YA/X6YB/X6Y
g Terminal block X1M (power supply)
h Terminal block X2M (high voltage)
i Terminal block X5M (low voltage)
j Cable tie mountings
k Main PCB (refrigerant, brine) A9P
l Main PCB (inverter) A10P
m Digital I/O PCB A4P (optional)
n Demand PCB A8P (optional)
o Brine pump contactor K6M. **Note:** Only 4 of the 5 connection points are used.
p Reactors
q PCB fuse A1P (FU1)
r PCB fuse A9P (F1U, F2U)
s PCB fuse A10P (F1U)

14.4 Piping diagram

14.4.1 Piping diagram: Indoor unit



(*) Depicted is example, for complete installation requirements, refer to installation manual

Description sensors	
R1T in	Outlet Water Temperature Sensor (LWC)
R2T in	After BUH Temperature Sensor
R3T in	Refrigerant Liquid Temperature Sensor
R4T in	Inlet Water Temperature Sensor (EWC)
R5T in	DHW Tank Temperature Sensor
R1T out	Ambient Air Sensor
R2T out	discharge sensor
R3T out	suction sensor
R4T out	2 phase sensor (Tx)
R5T out	brine entering water
R6T out	brine leaving water

LEGEND:

	CHECK VALVE		SCREW CONN.
	FLARE CONN.		QUICK COUPLING
	SPINNED PIPE		FLANGE CONN.
	PINCHED PIPE		BRAZED CONN.

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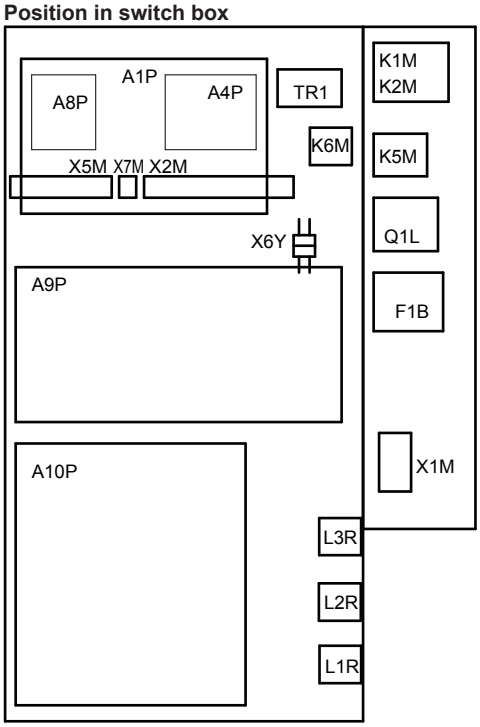
14.5 Wiring diagram

14.5.1 Wiring diagram: Indoor unit

See the internal wiring diagram supplied with the unit (on the inside of the indoor unit switch box cover). The abbreviations used are listed below.

Position in switch box



User installed options:

Remote user interface

External indoor thermistor

Digital I/O PCB

Demand PCB

Brine pressure switch connection kit

Main leaving water temperature:

On/OFF thermostat (wired)

On/OFF thermostat (wireless)

External thermistor on On/OFF thermostat (wireless)

Heat pump convector

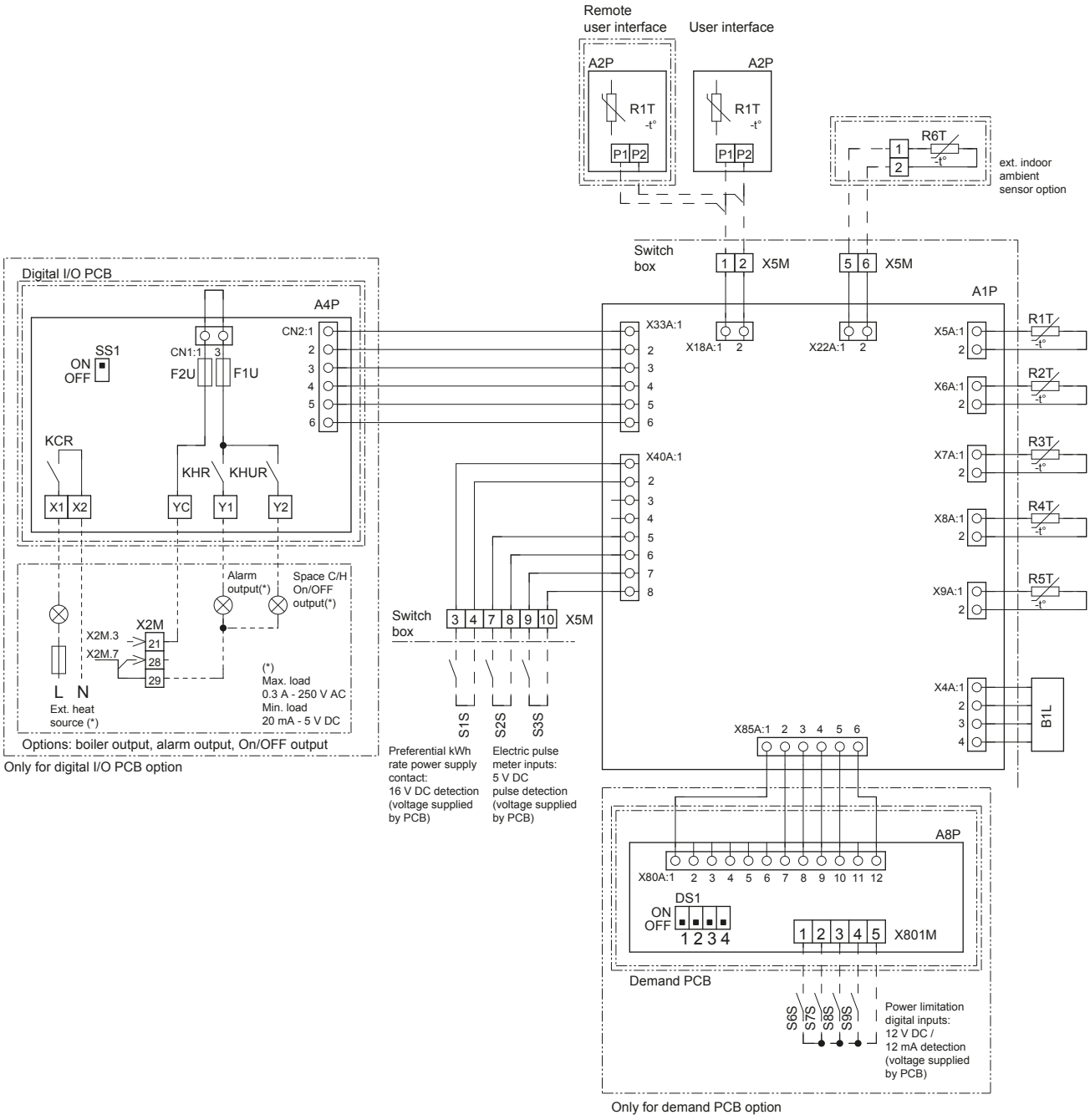
Additional leaving water temperature:

On/OFF thermostat (wired)

On/OFF thermostat (wireless)

External thermistor on On/OFF thermostat (wireless)

Heat pump convector



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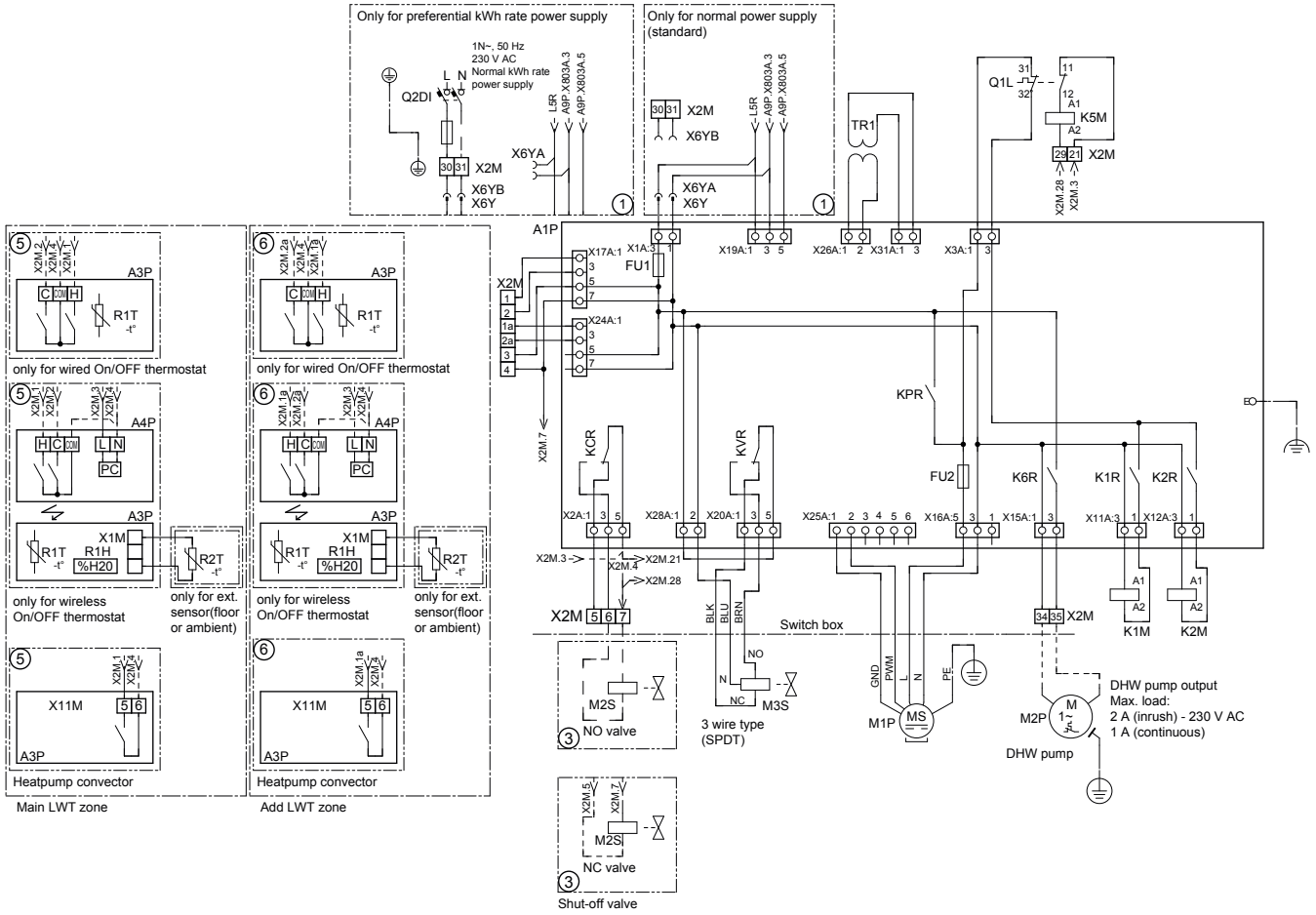
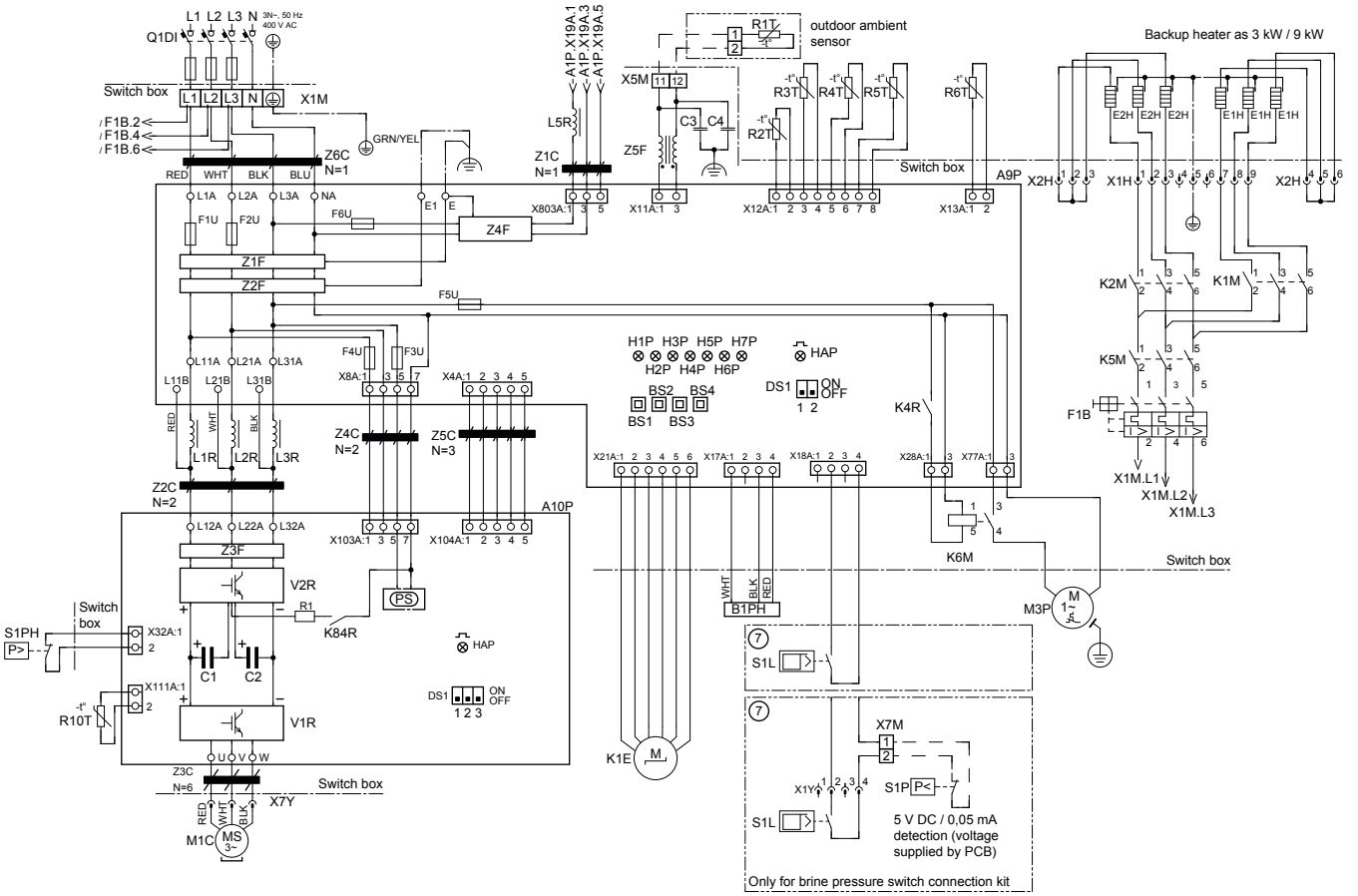


4D081377-1A_page 5


Switch box
Switch box
Switch box
Switch box
Switch box
outdoor ambient sensor
Backup heater as 3 kW / 9 kW
Only for brine pressure switch connection kit
5 V DC / 0,05 mA detection (voltage supplied by PCB)

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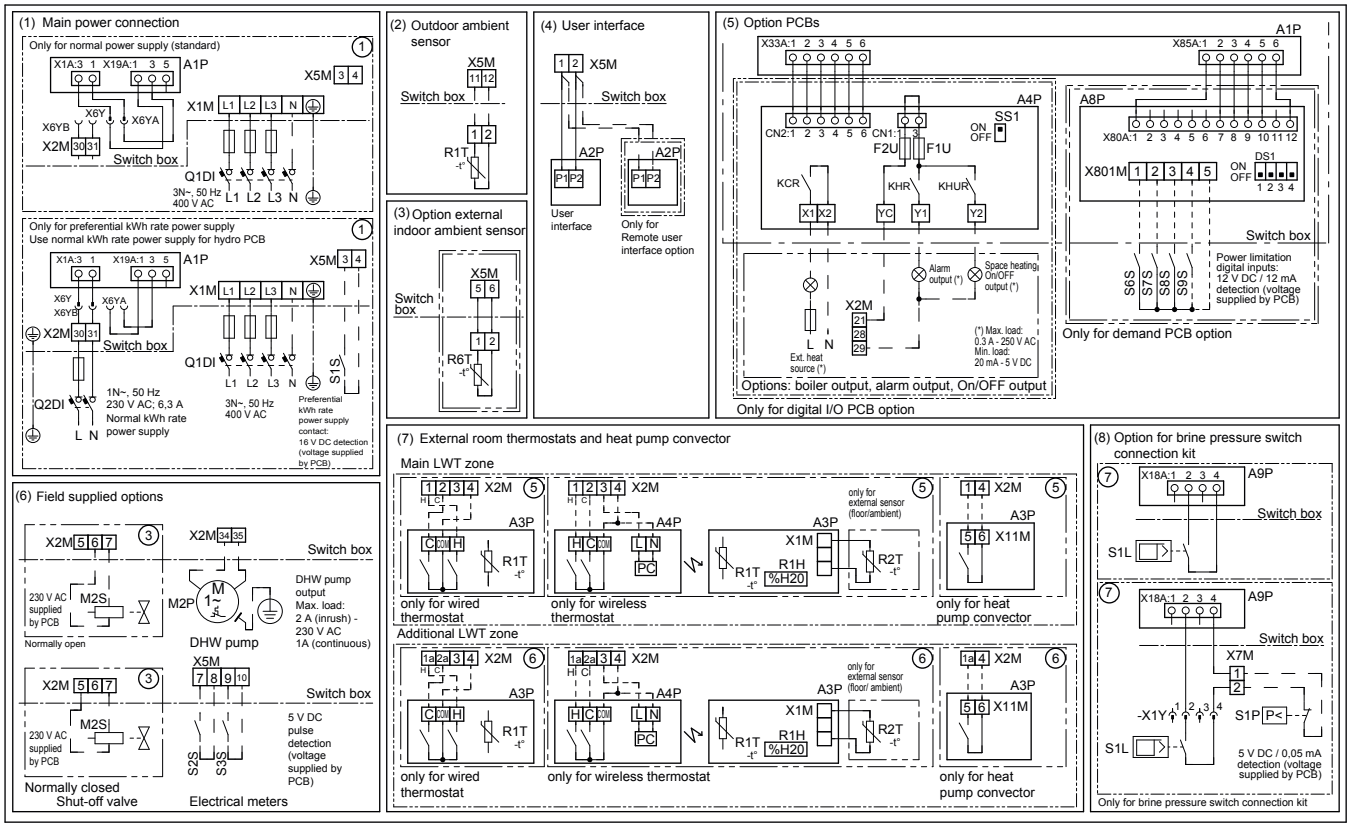
A1P		Main PCB (hydrobox)
A2P		User interface PCB
A3P	*	On/OFF thermostat
A3P	*	Heat pump convector
A4P	*	Digital I/O PCB
A4P	*	Receiver PCB (Wireless On/OFF thermostat, PC=power circuit)
A8P	*	Demand PCB
A9P		Main PCB (refrigerant, brine)
A10P		Main PCB (inverter)
B1L		Flow sensor
B1PH		High pressure sensor
BS1~BS4		Push button
C1~C4		Capacitor
CN* (A4P)	*	Connector
DS1 (A8P)	*	DIP switch
DS1 (A9P)		DIP switch
DS1 (A10P)		DIP switch
E1H		Backup heater element (1 kW)
E2H		Backup heater element (2 kW)
F1B		Overcurrent fuse backup heater
F1U, F2U (A4P)	*	Fuse 5 A 250 V
F1U, F2U (A9P)		Fuse 35.5 A 500 V
F3U~F6U (A9P)		Fuse T, 6.3 A 250 V
FU1 (A1P)		Fuse T, 6.3 A 250 V
H1P~H7P		LED
HAP		LED
K1E		Electronic expansion valve
K1M, K2M		Contactor backup heater
K5M		Safety contactor backup heater
K6M		Relay
K*R		Relay on PCB
L1R~L3R		Reactor
L5R		Reactor transmission line
M1C		Motor (compressor)
M1P		Main water supply pump
M2P	#	Domestic hot water pump
M3P		Brine supply pump
M2S	#	Shut-off valve
M3S		3-way valve for floor heating/domestic hot water
PS		Switching power supply
Q*DI	#	Earth leakage circuit breaker
Q1L		Thermal protector backup heater
R1		Resistor
R1T (A1P)		Outlet water heat temperature sensor (leaving water condenser)
R1T (A2P)		Ambient sensor user interface
R1T (A3P)	*	Ambient sensor On/OFF thermostat
R1T (A9P)		Ambient air sensor
R2T (A1P)		After backup heater temperature sensor
R2T (A3P)	*	External sensor (floor or ambient)
R2T (A9P)		Discharge sensor

R3T (A1P)		Refrigerant liquid side thermistor
R3T (A9P)		Suction sensor
R4T (A1P)		Inlet water temperature sensor (entering water condenser)
R4T (A9P)		2-phase sensor (Tx)
R5T (A1P)		Domestic hot water tank temperature sensor
R5T (A9P)		Brine entering water
R6T (A1P)	*	External indoor ambient thermistor
R6T (A9P)		Brine leaving water
R10T		Heat sink thermistor
R1H (A3P)	*	Humidity sensor
S1L		Brine flow switch
S1P	#	Water pressure switch brine side
S1PH		High pressure switch
S1S	#	Preferential kWh rate power supply contact
S2S	#	Electrical meter pulse input 1
S3S	#	Electrical meter pulse input 2
S6S~S9S	#	Digital power limitation inputs
SS1 (A4P)	*	Selector switch
TR1		Power supply transformer
V1R, V2R		Insulate gate bipolar transistor power module
X*H		Backup heater connector
X*M		Terminal strip
X*Y		Connector
Z1C~Z6C		Noise filter (ferrit core)
Z1F~Z5F		Noise filter
	* =	Optional
	# =	Field supply

Notes to go through before starting the unit

English	Translation
X1M	Main terminal
X2M	Field wiring terminal for AC
X5M	Field wiring terminal for DC
⏚	Earth wiring
- - - - - - -	Field supply
15	Wire number 15
—> **/12.2	Connection ** continues on page 12 column 2
①	Several wiring possibilities
	Option
	Not mounted in switch box
	Wiring depending on model
	PCB


(1) Main power connection
Only for normal power supply (standard)
Switch box
3N~, 50 Hz 400 V AC
Only for preferential kWh rate power supply
Use normal kWh rate power supply for hydro PCB
1N~, 50 Hz 230 V AC; 6,3 A Normal kWh rate power supply
3N~, 50 Hz 400 V AC
Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB)
(2) Outdoor ambient sensor
(3) Option external indoor ambient sensor
(4) User interface
User interface
Only for Remote user interface option
(5) Option PCBs
Options: boiler output, alarm output, On/OFF output
Only for digital I/O PCB option
Only for demand PCB option
Power limitation digital inputs: 12 V DC / 12 mA detection (voltage supplied by PCB)
(*) Max. load: 0.3 A - 250 V AC Min. load: 20 mA - 5 V DC
(6) Field supplied options
Normally open
DHW pump output Max. load: 2 A (inrush) - 230 V AC 1A (continuous)
DHW pump
Normally closed
Shut-off valve
5 V DC pulse detection (voltage supplied by PCB)
Electrical meters
(7) External room thermostats and heat pump convector
Main LWT zone
Additional LWT zone
only for wired thermostat
only for wireless thermostat
only for heat pump convector
only for external sensor (floor/ ambient)
(8) Option for brine pressure switch connection kit
Only for brine pressure switch connection kit
5 V DC / 0,05 mA detection (voltage supplied by PCB)

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Electrical meter specification

- Pulse meter type / voltage free contact for 5 V DC detection by PCB
- Possible number of pulse:
  - 0.1 pulse/kWh
  - 1 pulse/kWh
  - 10 pulse/kWh
  - 100 pulse/kWh
  - 1000 pulse/kWh
- Pulse duration
  - minimum On time 40 ms
  - minimum OFF time 100 ms
- Measurement type (depending on installation):
  - single phase AC meter
  - three phase AC meter (balanced loads)
  - three phase AC meter (unbalanced loads)

Electrical meter installation guideline

- General: it is the responsability of the installer to cover the complete power consumption with electrical meters (combination of estimation and metering is not allowed)
- Required number of electrical meters:

Electrical meter type	Regular kWh rate power supply
1~	—
3~ balanced	1
3~ unbalanced	—

Electrical meter type	Benefit kWh rate power supply
1~	1
3~ balanced	1
3~ unbalanced	—

14.6 Technical specifications

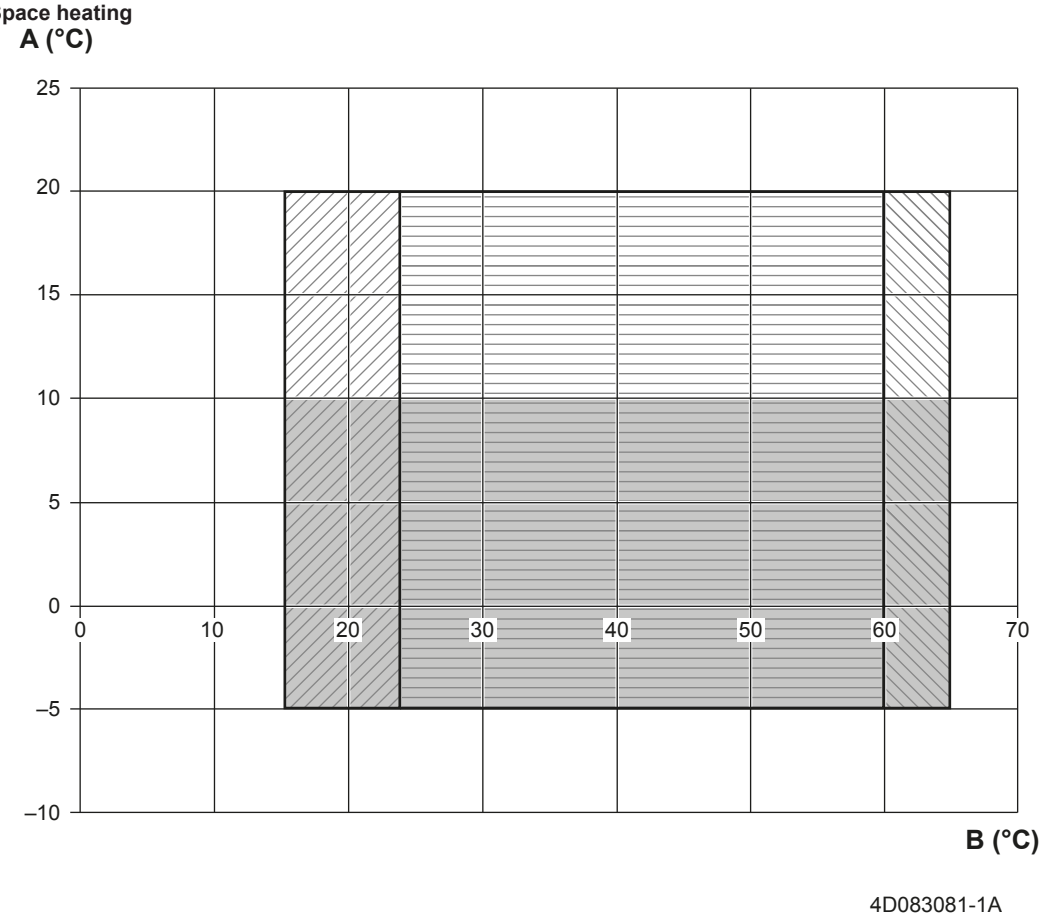
14.6.1 Technical specifications: Indoor unit

Circuit	Operating temperature	Operating pressure
Space heating	15~65°C	1~4 bar
Domestic hot water	15~65°C	1~10 bar
Brine	–15~20°C	1~4 bar
Room temperature	5~30°C	Not applicable

14.7 Operation range

14.7.1 Operation range: Indoor unit

Space heating



4D083081-1A

A Entering brine temperature
B Leaving condenser water temperature
▨ Only backup heater operation if the set point is <24°C.
▤ Heat pump operation (assisted by backup heater if capacity shortage)
▧ Heat pump + backup heater operation
■ Protect against freezing by adding anti-freeze to brine side. See also remark.

Remark: By default settings, the unit will allow operation with entering brine temperatures to –5°C. As a result, the brine freezing temperature may not be higher than –15°C. For water – ethanol mixtures this corresponds to 29% ethanol (by mass), for water – propylene glycol mixtures this corresponds to 40% propylene glycol (by volume).

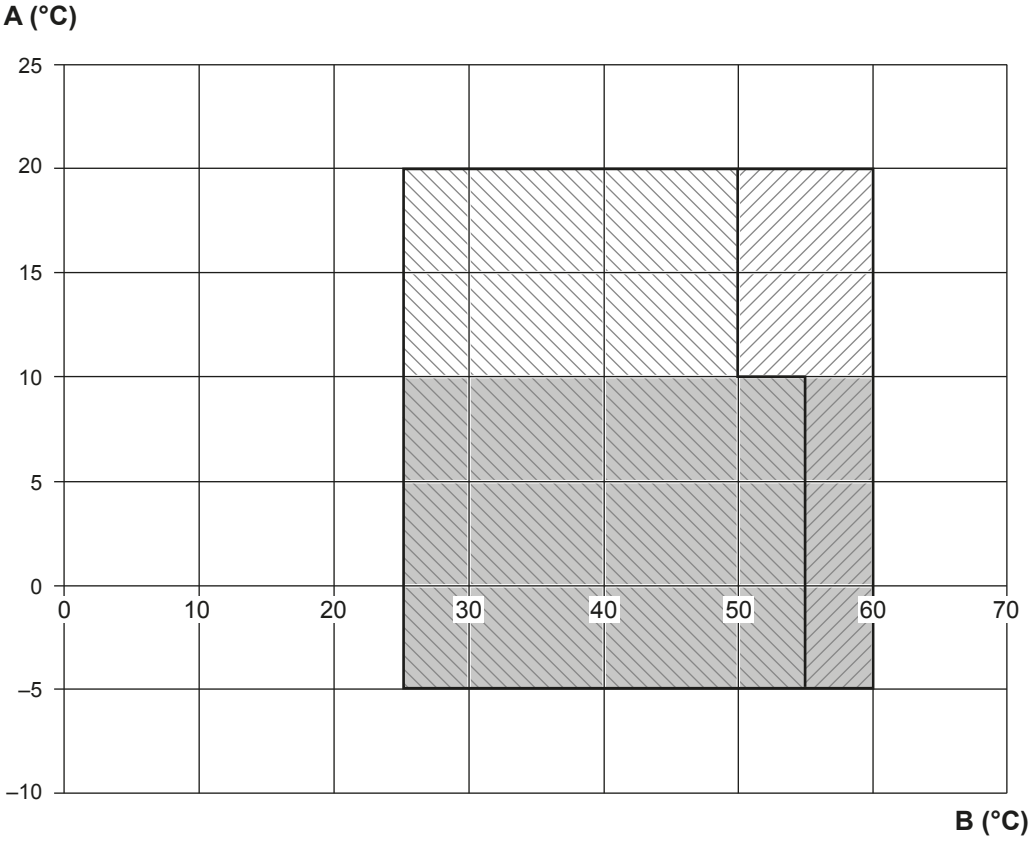
If the freezing temperature of the medium is higher than –15°C, then protection level of unit MUST be increased by field setting.

Refer to the installation manual and/or installer reference guide for instructions how to set a different freeze temperature of the medium (Tf) in the controller.

The unit will NOT operate at an entering brine temperature lower than Tf+10K.

Tf=changeable between 0°C and –15°C.

Domestic hot water



4D083082-1B

A Entering brine temperature
B Leaving condenser water temperature
▨ Only backup heater operation.
▧ Heat pump operation
■ Protect against freezing by adding anti-freeze to brine side. See also remark.

Remark: By default settings, the unit will allow operation with entering brine temperatures to –5°C. As a result, the brine freezing temperature may not be higher than –15°C! For water – ethanol mixtures this corresponds to 29% ethanol (by mass), for water – propylene glycol mixtures this corresponds to 40% propylene glycol (by volume).

If the freezing temperature of the medium is higher than –15°C, then protection level of unit MUST be increased by field setting.

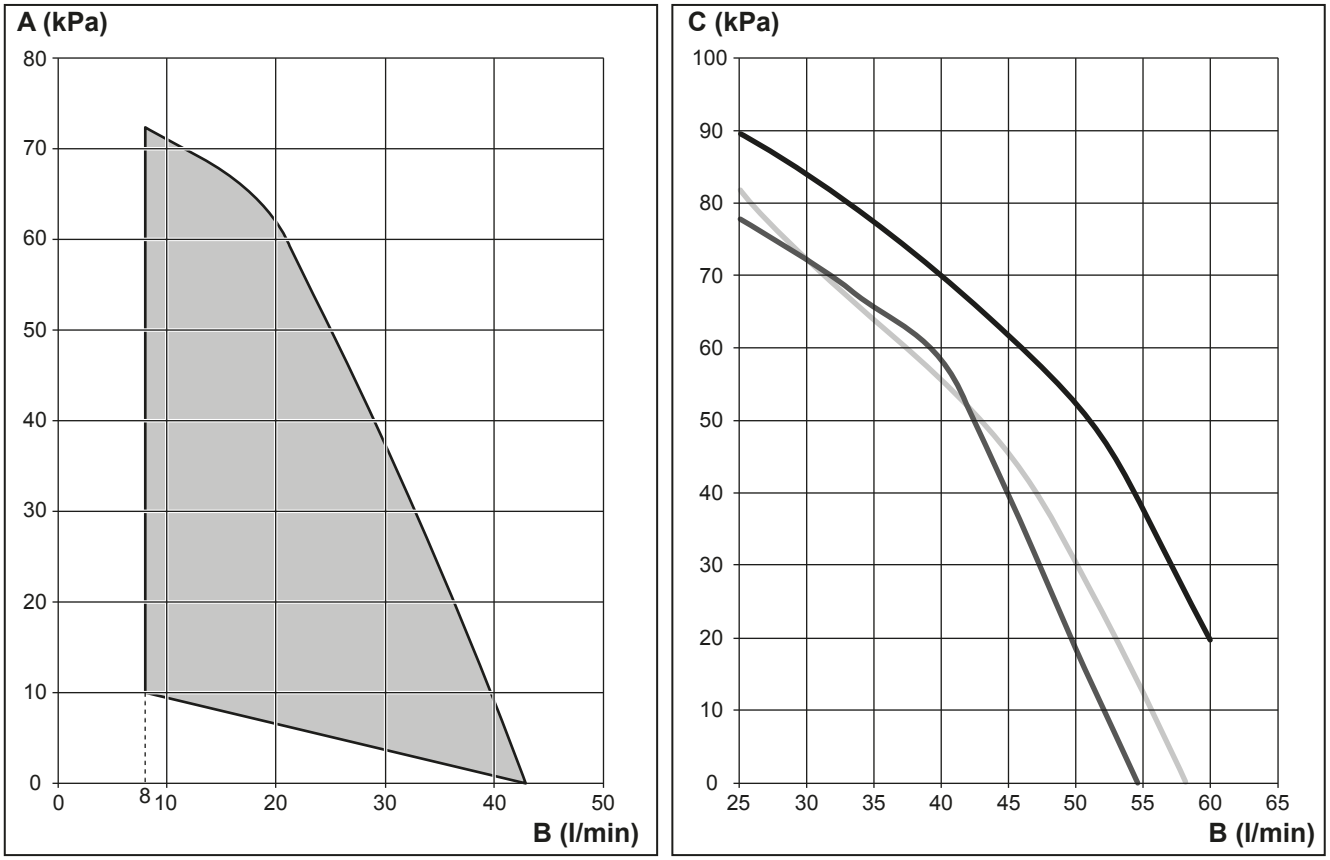
Refer to the installation manual and/or installer reference guide for instructions how to set a different freeze temperature of the medium (Tf) in the controller.

The unit will NOT operate at an entering brine temperature lower than Tf+10K.

Tf = changeable between 0°C and –15°C.

14.8 ESP curve

14.8.1 ESP curve: Indoor unit



3D081379-1B

A External static pressure (space heating side)
B Water flow rate
C External static pressure (brine side)
Water
Mixture water/propylene glycol (40 V%) at entering brine temperature –5°C
Mixture water/ethanol (29 M%) at entering brine temperature –5°C

Note: Selecting a flow outside the area of operation can cause damage or malfunction of the unit.

15 Glossary

Dealer

Sales distributor for the product.

Authorized installer

Technical skilled person who is qualified to install the product.

User

Person who is owner of the product and/or operates the product.

Applicable legislation

All international, European, national and local directives, laws, regulations and/or codes that are relevant and applicable for a certain product or domain.

Service company

Qualified company which can perform or coordinate the required service to the product.

Installation manual

Instruction manual specified for a certain product or application, explaining how to install, configure and maintain it.

Operation manual

Instruction manual specified for a certain product or application, explaining how to operate it.

Accessories

Labels, manuals, information sheets and equipment that are delivered with the product and that need to be installed according to the instructions in the accompanying documentation.

Optional equipment

Equipment made or approved by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

Field supply

Equipment not made by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

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